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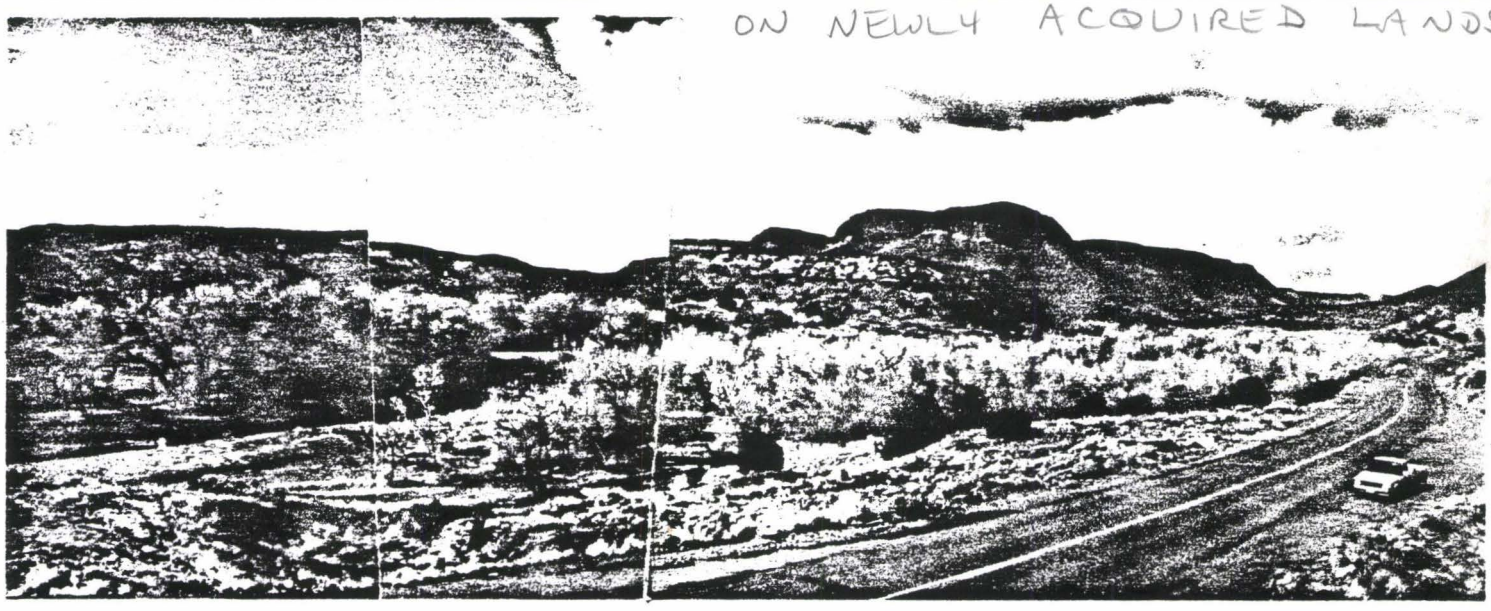
ENVIRONMENTAL ASSESSMENT

CAPITAL INVESTMENT PROJECT PROPOSAL
RECREATION MANAGEMENT PLAN

LOWER JEMEZ RIVER CORRIDOR

THOMPSON

SUBTITLE: CALCULATING THE PRESENT AND FUTURE RECREATION ON NEWLY ACQUIRED LANDS



SANTA FE NATIONAL FOREST

JEMEZ RANGER DISTRICT

Floyd A. Thompson

1982

SUMMARY

ENVIRONMENTAL ASSESSMENT
FOR
RECREATION DEVELOPMENT PROPOSALS AND MANAGEMENT PLANS
OF THE
LOWER JEMEZ RIVER CORRIDOR

An environmental assessment and recreation project proposal has been prepared for the recently acquired Santa Fe National Forest lands along the lower Jemez River Corridor, located in T.17, T.16 and R.2E of Sandoval County, New Mexico. The assessment discusses measures to; (1) provide for the health and safety of recreationists, (2) protect threatened and endangered (T&E) species critical prey habitat, (3) enhance riparian ecosystem condition, and (4) increase the quality of recreational river uses. The complete assessment report is available for review in the Forest Supervisor's Office in Santa Fe and in the Jemez District Office in Jemez Springs, New Mexico.

Three alternatives were identified in the assessment for detailed evaluation. Alternative One, represents no change in present management. The effects would be increased; vehicular intrusion, vegetative cover reduction, and human penetration into critical T&E species prey habitat. Alternative Two, represents maximum facility development for 245 paved parking spaces and restrictions for vehicular access to remaining areas within the corridor. The effects would be over-development; attracting increased capacity use which may adversely impact the stability of the T&E species and riparian zone. It may also create developments which would eventually be in direct competition with adjacent private and other ownerships. Alternative Three, represents a phased development of only 157 parking spaces, which would also restrict vehicular access to remaining areas within the river corridor and limit parking capacity off State Road 4. The effects would be; reduced impacts to the riparian ecosystem, improved access facilities to compliment private and other ownerships, and protection of critical T&E species prey habitat.

Alternative Three provides the best combination of physical, biological, social, and economic benefits and is considered to be the environmentally preferable alternative.

This is not a major Federal action that would significantly affect the quality of the human environment. It was included in the Santa Fe National Forest Land Management Plan as a specific recreation capital investment project proposal. Therefore, an Environmental Impact Statement is not required.

ABSTRACT

In 1980-81, the Santa Fe National Forest acquired over nine additional miles of riparian zone along the Lower Jemez River, through a Land and Water Conservation Fund (L&WCF) purchase of the Walsh Properties. These lands are currently experiencing regular visitation by fishing, camping and picnicking users, even though new signing is not yet in place. The stream has a high potential for development as a trout fisheries and is also considered to be important prey habitat for a nationally listed Threatened and Endangered (T&E) species. The Jemez Ranger District administers the new lands, but no specific management plan as been prepared within the general Forest Land Management Plan (FLMP) to address the multiple uses of the area.

This study was prepared to develope a site concept plan for the present and future preferred recreation use of the area. The Recreation Opportunity Spectrum (ROS) concept was utilized to determine acceptable levels of management controls and site development for maintaining or improving; (1) the health and safety of users, (2) critical prey habitat for T&E species, (3) vitality of the riparian ecosystem, and (4) the existing Recreation Opportunity Spectrum (ROS) setting of Roaded Natural RN.

The critical importance of the T&E species required an estimation of a current and practical maximum ROS capacity. Experts wanted to know if new recreation developments, as a part of the total management for the area, would increase current use impacts to the area or, would they maintain them within the present patterns of existing use.

A use capacity figure was developed, based upon user patterns, user preferences, and guideline ROS capacities. It is interesting that the projects final capacity figure, was very similar to the ROS User's Guide capacity coefficients for riparian areas within a Roaded Natural Opportunity Setting. This figure was then analysed from a demand standpoint to determine probable use of the area by 1990. A unit (PAOT) capacity for site development was calcuated from this use figure and distributed among several areas along the river corridor. The purpose of these sites was to facilitate fishing access and other dispersed recreation activities within the RN setting.

The concept maintained or improved the existing RN ROS setting; providing only those new developments necessary for accommodating current and future use to 1990. Also, it proved to be the preferred management solution for general enhancement of the riparian zone, and associated T&E species prey habitat.

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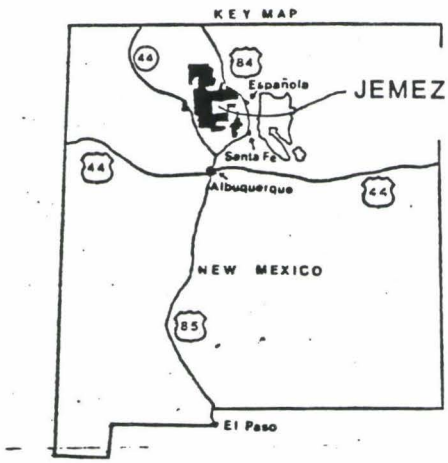
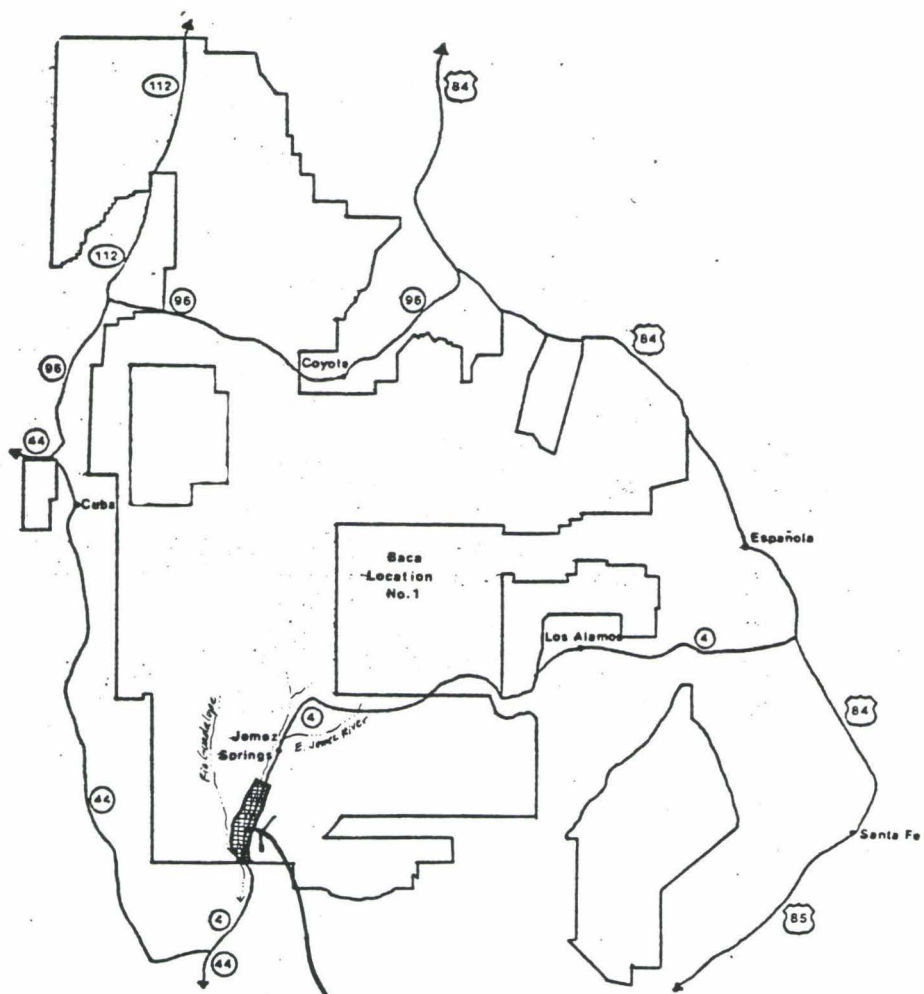


LOCATION MAP

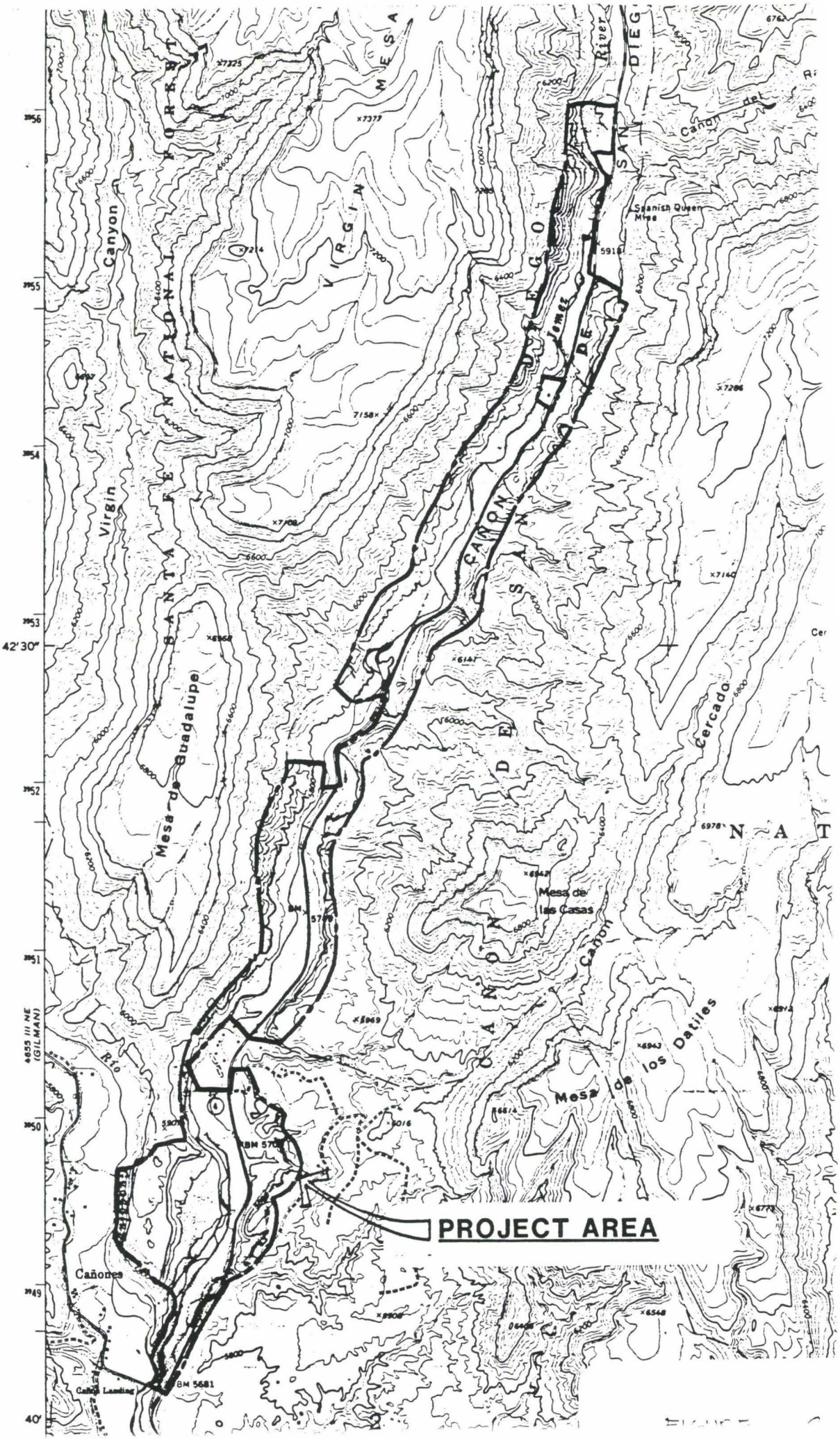
SANTA FE NATIONAL FOREST



JEMEZ DIVISION

PROJECT AREA

FIGURE 1.


PROJECT AREA
Mesa de Guadalupe
Virgin Canyon
SANTA FE NATIONAL FOREST
VIRGIN MESA
CAÑON DE SAN DIEGO
Mesa de las Casas
Mesa de los Datiles
Cañones
Río
Spanish Queen Mine
Cercado
BM 5681
BM 5700
4655 III NE (GILMAN)

CHAPTER I

CHAPTER I - Introduction

Introduction

This feasibility study examines the recreational development potential of newly acquired Forest Service lands along the lower Jemez River, presenting an indepth examination of the interrelationships between recreation activities, their settings, and the riparian wildlife ecosystem. The project area encompasses nine miles of the meandering lower Jemez River, situated at the mouth of Jemez Canyon in Sandoval County, New Mexico. The lands were acquired through a Land and Water Conservation Fund (L&WCF) purchase, for the primary use of recreation oriented activities.

The Jemez Ranger District, of the Santa Fe National Forest, administers the natural habitats of the area. The New Mexico Game and Fish Department (NMGFD) assists in the management of wildlife and fish species. A one hundred and fifty foot right-of-way was retained in fee simple ownership by the New Mexico State Highway Department (NMSHD), along the section of State Road 4 that extends through the river corridor; seventy five feet each side of centerline.

The Lower Jemez River has been identified as prime habitat for a potential fall/winter/spring trout fisheries. The Santa Fe National Forest has already completed some stream habitat improvement. The Lower Jemez riparian zone has also been identified as important prey habitat for a T&E species.

Need

The Draft Forest Land Management Plan (FLMP) has been completed for the Santa Fe National Forest. The FLMP analyses the Forest needs for developed rec-

reation and provides general direction on meeting the forest-wide demand for water-based recreation opportunities. It specifically identifies the Lower Jemez corridor as one of it's top priority areas for providing developments to support water oriented recreation (Figure 3).

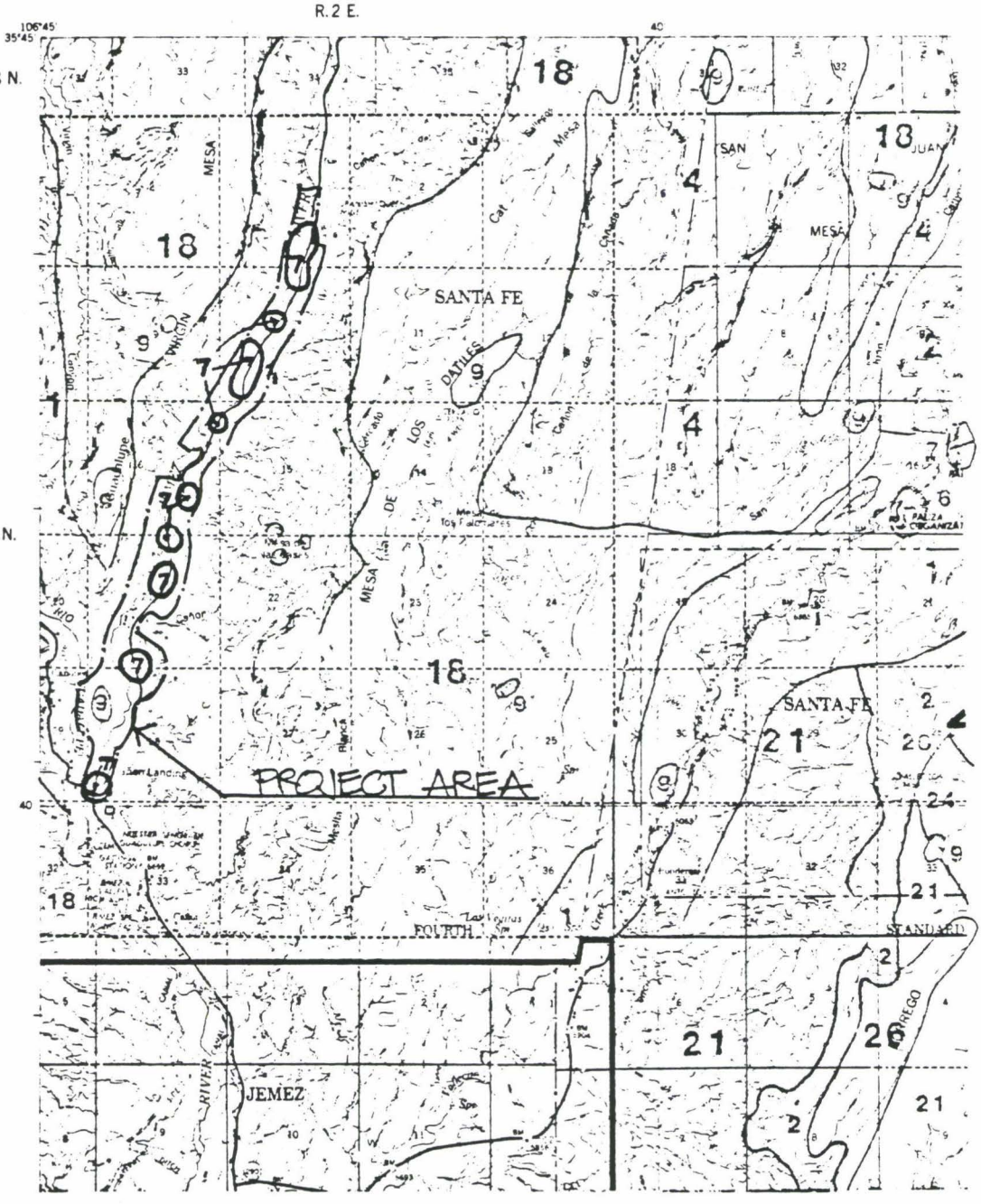
This feasibility study further supports the analysis done for the FLMP; providing a more detailed project level analysis of the appropriate scale of development for the various "recreation opportunities"[1] available within the Lower Jemez River corridor.

Purpose

The primary task of this feasibility study is to determine the current pattern of use within the corridor and the relationship of this pattern to an acceptable practical maximum capacity for maintaining the desired Recreation Opportunity Spectrum[2] (ROS) setting of Road Natural. The results are then used to formulate a preferred phased development concept plan for the needed capital investment improvements identified by the study.

[1] ROS USER'S GUIDE defines opportunities as: "The availability of a real choice for a user to participate in a preferred activity within a preferred setting, in order to realize those satisfying experiences which are desired.

[2] RECREATION OPPORTUNITY SPECTRUM (ROS): A method of delineating types of recreation opportunity settings. There are six ROS settings. Only the first five are evident on the Santa Fe National Forest. These settings are: Primitive - essentially unmodified natural environments; Semi-Primitive Non-Motorized - Predominantly natural or natural appearing environments without motorized use; Semi-Primitive Motorized - Predominantly natural or natural appearing enviornments where motorized use occurs. Roaded Natural - Prodominantly natural appearing environments with moderate evidence of the sights and sounds of man; Rural - Modified natural environment with facilities for special activities. Urban - substantially urbanized environment.



PROPOSED SANTA FE NATIONAL FOREST PLAN

SCALE

57

Prescription: #7

Description: Suitable areas with potential as development sites for public recreation.

Capability Areas: 6, 7, 13, 16, 18-21, 23, 25, 26, 31-33, 38

FIGURE 22.

Objectives:

1. Maintain or reduce the general extent and pattern of current user impacts within the existing Roaded Natural (RN) ROS setting of the project area. It is hypothesized that the current pattern of use best approximates the areas practical maximum RN ROS capacity, while retaining critical prey habitat conditions for the T&E species.

2. Control the amount of vehicular access into the riparian zone and concentrate the impacts into smaller Rural (R) developed settings. This would further enhance the RN ROS setting by reducing extensive human impacts across the entire area.

Basic Assumptions:

1. Use will increase immediately across the entire project area following sign posting as National Forest land.

2. Access is a primary tool for managing dispersed recreation activities.

3. The lower Jemez River offers excellent potential for development as a managed trout fisheries with regular stocking from October - May.

4. Water-based recreation use will increase by 1990 by at least the same rate as U.S. Census population growth projections (20-21%).

5. Failure to establish management controls soon after signing as National Forest land will allow present use patterns to intensify; creating greater difficulty to enact new access controls at a later time.

Limitations:

Instead of expending a majority of the time conducting a thorough on-site user study (questionaires), the study utilized Jemez Ranger District personnel observations of use during various time periods, and correlated this with on-site inventories of human impacts on a typical site within the project area. In addition, there is limited material or research which either confirms or refutes the carrying capacity methodology and maximum use coefficients developed by the U.S. Forest Service ROS User's Guide. Also, few studies were found which established definable levels of managerial controls and social interactions acceptable to users of various ROS settings.

Within the context of these limitations, this study developed a method of use estimation by analyzing the interrelationships between existing patterns of user impacts and the practical maximum capacity for a given ROS setting.

CHAPTER II

CHAPTER II - Existing Situation/Related Research

The basic problem, as stated in Chapter I, is how to determine appropriate development levels and managerial controls for the newly acquired lands along the lower Jemez River, to address: (1) critical wildlife habitat needs, (2) 100 year floodplain requirements, and (3) practical maximum ROS capacities for the Roaded Natural (RN) setting.

Existing Situation:

The existing situation along the Lower Jemez River is the result of a long history of private ownership. Before acquisition into federal ownership, the lands were predominantly those belonging to the Walsh Properties. These owners constructed several large berms along the river to create subdivision lots that were protected from 100 year flood levels. Though massive in scale, the construction areas have revegetated; providing more usable terrain for recreation development than would have been available otherwise.

The Walsh owners were quite considerate regarding recreation use of the area. They tolerated most all types of activities; signing the area only with "private property" and "pick up the trash" signs to encourage self-maintenance of the area. Extensive wheel track access developed off of State Road 4 where fishing enthusiasts, picnickers, painters, bathers, and other intimiate encounter seekers, made their own paths into favorite settings along the river, or under the large cottonwoods.

In spite of the signing attempts, fairly heavy accumulations of trash built up around these favored areas. In the years preceding federal acquisition, and continuing to date, a user from nearby Albuquerque took on a personal crusade to pick up as much of the trash as he could handle. Though the area improved substantially, a good deal of trash dumps are still existing. In addition, several of these favored sites received a fairly constant number of users; resulting in a substantial reduction in the ground cover.

Another important aspect of these acquired lands is the State Road 4 one hundred and fifty foot right-of-way. This corridor of land is owned in fee simple by the New Mexico State Highway Department (NMSHD) and did not pass into federal ownership with the transfer of the Walsh Properties. This road corridor contains many of the existing suitable pulloffs now being used by the public. In many places they are the only suitable parking areas adjacent to the river and outside critical floodplain conflicts. Any concept plan for managing the Lower Jemez River must incorporate these NMSHD pulloffs; making them part of the support facilities for uses of the river. In essence, the NMSHD and the Santa Fe National Forest must jointly cooperate in the management of this riparian corridor.

Related Research:

For a clear understanding of the total management problem offered by the lower Jemez River project, a further degree of study is required into some specific topical areas. The first, concerns the importance of riparian habitats in New Mexico and the relationship of these values to recreation and aesthetic

concerns. The second, deals with the relative demand for water-based recreation opportunities in the Southwest, and the proximity of potential users to this project area. The third, looks at the diversity of user preferences for different activities and their compatibility with the ROS settings within the Lower Jemez River corridor. The fourth, involves a study of user capacity to establish maximum use guidelines for an identified ROS setting. Finally, related reports and management alternatives that have been applied in other similar situations are analysed for potential commonality with this project.

These areas of concern have been highlighted in the following sections to emphasize their importance to this project. In each section, related research findings from other authors are cited, and discussed, as to their implications for management of the lower Jemez River.

Importance of Riparian Habitats: Southwest Lands

The importance of any water development or riparian habitat, to recreation use patterns in the Southwest landscape, cannot be over emphasised. Any river, stream, lake or reservoir, existing or created, are primary attractors for a significant proportion of the total activity for camping, picnicking, hiking, and sightseeing. In the Southwest/Rocky Mountain regions, water-based activities are both the most popular, and account for a major portion of, the total outdoor recreation activity. Although fuel and energy related problems, will cause some adjustments in recreation use patterns, growth of water-based activities is expected to continue (Phillips, 1979).

It is the sharp contrast the river zone creates with the Southwest landscapes, which makes the riparian area such a unique setting for recreation activities. The attraction of these areas to the populations of the Southwest, places a special challenge on all land managing agencies to find ways to accommodate the increasing recreational use of these rivers and streams; minimizing the infringement on other critical uses such as wildlife habitat and water supply.

For decades, the primary or dominant use of riparian habitat in the Southwest has been water management; other values receiving a lesser consideration. The dominant use was to supply agricultural and metropolitan areas with water. In the process, wildlife populations and recreation users have had to adapt, placing greater pressures on remaining riparian areas to satisfy their needs. Wildlife has been especially effected by this trend (Davis, 1977).

In general, riparian habitats receive proportionately more use per unit area than any other land type in the Southwest. A very large percentage of terrestrial species known to occur in a given area, are either directly dependent on riparian land types, or utilize them proportionately more than any other zone. In essence, the riparian zone is the most important habitat type in the Southwest for wildlife (Davis, 1977).

The lower Jemez River presents a classic example of the critical importance of riparian zones to both wildlife and recreation. The management challenge is further increased within the project area, by the presence of critical prey habitat for an important threatened and endangered species. Situated within close proximity to over half a million people, these wildlife factors provide a special challenge for arriving at a suitable concept for both recreation and wildlife.

Recreation Demand:

Methods for calculating recreational demand vary as to their techniques and philosophy. The approach taken in the Santa Fe National Forest Land Use Plan is a combination of methods. These methods are: (1) potential supply (population estimates within proximity of the project); (2) past use trends (estimated numbers of visits); (3) preferences; and (4) scarcity of opportunities (the significance of future opportunities) relative to the context of the project. The following analysis is a further refinement of these four that were done for the Forest Plan; specifically addressing the demand potential for recreation within the Lower Jemez River corridor.

1. Potential Supply

Potential supply and its proximity to the project can be calculated through a localized demographic analysis (Figure 3). The following is a summary of the analysis done for the lower Jemez River corridor.

Demographic Analysis

The total population within the primary areas tributary to the project is estimated to be in excess of 900,000 persons. The population distribution is estimated to be as follows:

0-25 miles	33,852 people*
26-50 miles	101,438 people
51-100 miles	607,399 people
101-150 miles	913,956 people

*1980 Census Final

This corresponds to a driving time relationship of ½ hour, 1 hour, 3 and 5 hours respectively, assuming a National speed limit of 55 m.p.h.

Relationship of Project to Urban Areas

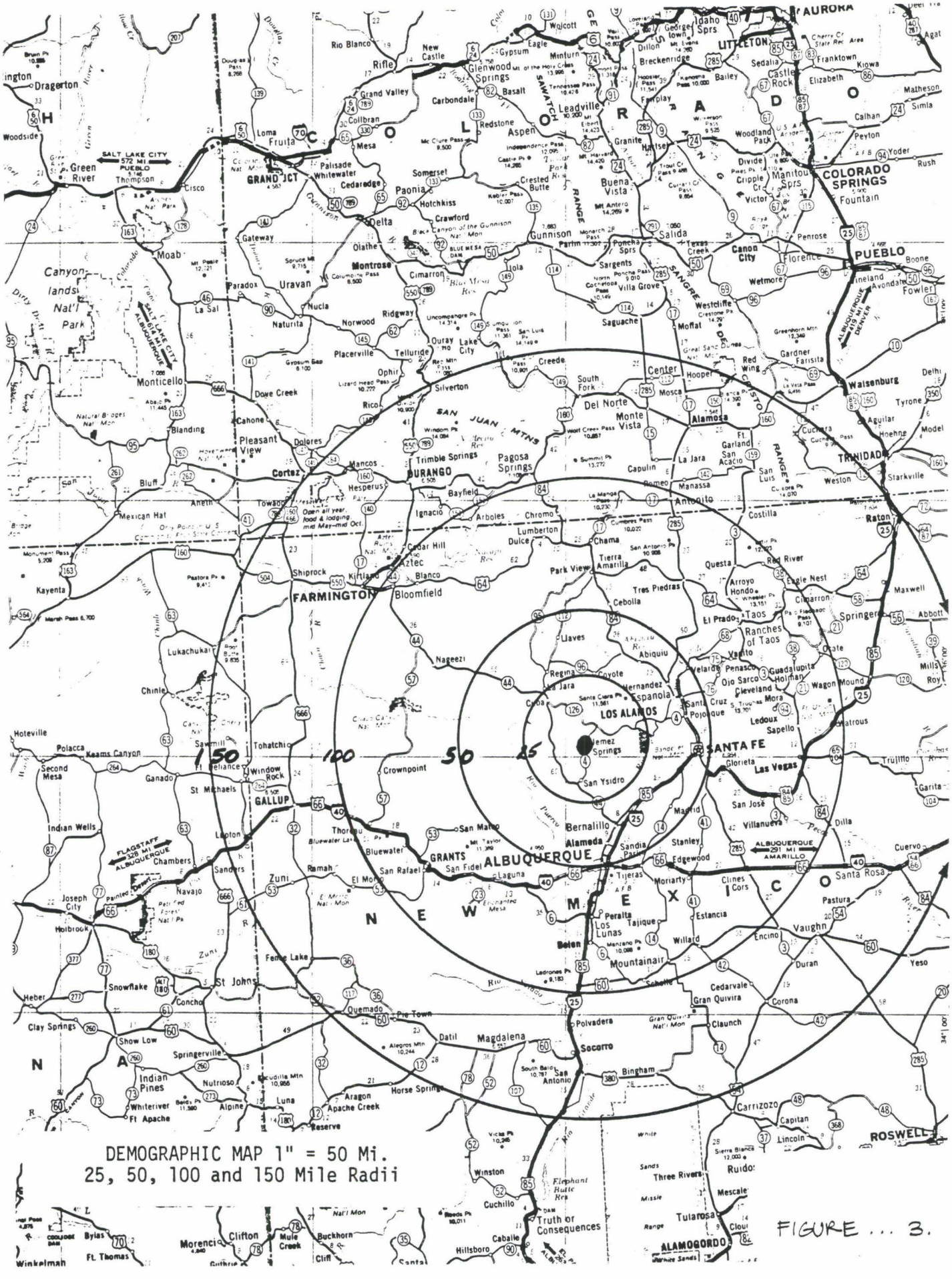
Urban centers (over 2,500 people) proximate to the project include:

1 hour: Los Alamos, White Rock, Espanola, Santa Fe, Bernalillo, and sections of Albuquerque, New Mexico.

3 hours: Taos, Las Vegas, Albuquerque, Belen, Grants, Gallup, Farmington, Aztec, New Mexico and Durango, Colorado.

5 hours: Raton, Clayton, Tucumcari, Clovis, Santa Rosa, Roswell, Socorro, Truth or Consequences, Ruidoso, Tularosa, Alamogordo, White Sands, Silver City, New Mexico; Cortez, Montrose, Gunnison, Salida, Canon City, Monte Vista, Alamosa, Walsenberg, Trinidad, Colorado; Springerville and Holbrook, Arizona.

Also, in the Southwest, travelers tend to accept longer travel distances which would encourage use from additional urban centers, such as Las Cruces, Carlsbad and Hobbs, New Mexico; El Paso, Lubbock and Amarillo, Texas; and possibly Pueblo, Colorado Springs and Grand Junction, Colorado.



DEMOGRAPHIC MAP 1" = 50 Mi.
25, 50, 100 and 150 Mile Radii

FIGURE ... 3.

Transporation System

Good paved highways provide easy access to the project. Interstate Highways I-25 and I-40 lead into the north central portion of New Mexico, and State Highways 4, 44, and 126 carry traffic to and through the project.

No commercial transportation is available within the project. The closest commercial transportation is in Albuquerque, New Mexico, approximately 65 miles south of Jemez Springs.

Future Demographics in 1990 (Series I Projections, 1980 Census)

Table 1. shows the projected population estimates for counties within 1-1½ hour driving time for the project:

Table 1.

NM Counties*	1980	1990
Bernalillo	402,900	496,800
Los Alamos	17,300	19,300
Rio Arriba	29,000	34,200
Sandoval	27,900	39,500
Santa Fe	69,900	86,700
Total Change Equals 20% Increase of 2% per year	546,000	676,000

*Detail may not sum to total due to rounding differences.

Table 2. shows the New Mexico SCORP - 1976 (81 update) projected increases in demand statewide for the following activities:

Table 2. Number of Occassions

Activity	1980	1990	% Increase
Fishing	2,496,000	3,015,000	20.7
Picnicking	2,436,000	2,943,000	20.8
Hiking	1,231,000	1,487,000	20.7
Sightseeing	2,438,000	2,944,000	20.7

2. Past Use Trends

Table 3. shows a comparison between the population changes in Bernalillo and Sandoval Counties, and reported recreation use estimation on the Santa Fe National Forest between 1970-71 and 1979-80.

Table 3. Comparison Analysis

	1970-71	1979-80	% Increase
Santa Fe National Forest			
*(RVD) Developed Recreation	277,800	739,100	62.4
(RVD) Dispersed Recreation	269,700	838,200	67.8
Bernalillo/Sandoval Counties Population (U.S. Census)	333,266	446,875	25.4

*(RVD) = one 12 hour visit

The figures in Table 3. indicate an increase in leisure time activities per capita during the last decade. This is supported by the results

of the literature review on general leisure patterns in the United States during the 1970's and by the Analysis of the Management Situation (AMS) prepared under the Santa Fe National Forest Plan. It also shows that recreation use within the Forest has increased more than twice as rapidly as population growth; assuming the RVD estimations are correct.

3. Preferences:

Preliminary findings from the recent 1981 update of the New Mexico SCORP (1976) reveal some interesting activity preferences by the recreating public in Bernalillo and Sandoval counties. The survey of these two counties showed that the highest priority recreation need was for more and better developed waterbased opportunities. In Bernalillo County (Albuquerque area), the second most often received comment was for more water resources close to population centers.

4. Scarcity of Opportunities:

The New Mexico State Fish and Game Department has stated that the lower Jemez River possesses excellent opportunities as a seasonal trout fisheries. Due to private ownership conflicts, and other limitations, the portion of the lower Jemez River within the project area, has not been regularly stocked. If this river is finally developed and stocked as a trout fishery it will become the closest major trout fisheries to the Albuquerque metropolitan area. It will also be the closest river based recreation opportunity on National Forest land to Albuquerque. The opportunities available within the

project area are indeed scarce when considering their proximity to the primary urban center in New Mexico.

In summary, the demand for water-based opportunities will increase at a rate slightly higher than the increase in population. The percentage of increase over the next decade could range from a low of 20%, to a high of 65%. The scarcity of fisheries close to the metroplitan area of Albuquerque will create substantially higher fishing use within the project area; especially if the river habitat is improved and regularly stocked for trout fishing. This change in fishing use patterns would indicate that the high range of 65% is the more probable demand increase for the project area by 1990.

Carrying Capacity by ROS setting:

A review of the literature shows that some advancements have been made with respect to the relationship of user preferences within or between recreation activities, and a users desired physical, social, and managerial recreation setting. The initial research used in developing the Recreation Opportunity Spectrum (ROS) shows a very basic relationship between the opportunities people seek (demand), and the availability of compatible opportunity settings (supply). Basically, that relationship is that, the more a site is hardened and developed to handle increased use, the less demand there is by the original users for the new developed opportunity at that site. Use still increases on the new hardened site, but the demand group being satisfied has probably substantially changed (Downing

and Clark, 1979). But, research also indicates that, if the goal is simply to increase user satisfaction at a site, then expansion of unregulated facilities is not unproductive (Price, 1979). Thus, research has shown that before a decision to develop an area is made, a meticulous evaluation of the benefits of the existing setting is needed, to determine what experiential settings are being sacrificed, and how has that changed the capacity of the area to satisfy demand (Price 1979).

As an example, the Lower Jemez River as it now exists, offers a natural appearing river setting, accessible by vehicle or foot in almost every area. No major controls have been set, and most activities proceed at the will of the user. The density of user impacts is heavy in terms of observed site modifications, but actual social contact is only heavy in specific areas. In general, use has been moderated by the previous designation as private property, and only those users familiar with the area appear to utilize it with frequency.

As the lands are now available and open to public access, a new pattern of use and even clientel can probably be expected. The change in use will increase more rapidly, due to the close proximity of a major state scenic highway. These changes, will require a new management concept for the area, if the original setting is to be even partially retained.

Explaining the situation in terms of the Recreation Opportunity Spectrum (ROS), the project area is classified as a Roaded Natural (RN) setting with influences of Rural (R) character due to the paved state highway and small clusters of private developments. The social factors within the RN setting ran into a moderate to high level of interaction between users,

due to the factor of multiple access and a high volume of traffic along State Road 4. Managerial controls are low and do not inhibit activities to any great extent.

The anticipated problem is that designation as Forest Service land and the improved fisheries will raise use within the area to levels unacceptable, or inconsistent with the RN setting. The quality of recreational experiences will be reduced throughout the entire area.

The future challenge, then, is to manage the area for the high spectrum of RN characteristics; minimizing the amount of development, and the extent of management controls (Nash, 1978). It requires that a plan be developed which least alters the ROS setting of the area, maintains some opportunities for the present user demand group, and accomodates some of the expected increased demand by the new user groups for trout fishing and picnicking. Those users displaced by the small changes in setting, and still wanting a SPM-RN vehicle oriented experience, will have those opportunities in an adjacent canyon (Rio Guadalupe), which is currently set aside for this use. In fact, some of these users may already have switched to the adjacent canyon; due to more frequent encounters with heavy use concentrations within the project area.

Management Alternatives

The entire riparian zone within the lower Jemez River project area is within 500 feet from State Road 4. This road is the principal entrance point into the Jemez Mountains for thousands of recreationists from the

Albuqueruqe metropolitan area. Consequently, the entire section of river has a high potential for overuse; especially when signed as National Forest property. As the research noted, human impacts are more pronounced in those riparian areas where access is most convenient (Schmidly, 1978). The extent of impact, however, did not always correlate significantly with reduced ecological conditions (Schmidly, 1978). This may indicate that the observed reductions in vegetation along access routes and around use sites within the Lower Jemez area, is far less significant to the wildlife/ecologic habitats, than it is to the expectations of resource managers for a given ROS setting. It would appear then, that much of the lower Jemez River could be managed for a RN setting; allowing many of the present activities to continue (user constructed fire rings, picnic, fishing, etc.). Provided, of course, they meet the health and safety criteria for water quality, sanitation, and floodplain hazards (overnights).

To accommodate the need for more compatible levels of social interaction within the existing RN setting, small areas could be developed as hardened sites to absorb the more organized spectrum of picnic users and to provide sanitation facilities. The remaining areas could be closed to vehicular access; constructing parking lots off State Road 4 at regular intervals, to allow foot access to dispersed picnic and fishing sites. Overnight camping would be prohibited outside of the State Road 4 right-of-way, except in designated Rural ROS sites, to avoid the conflicts with the 100 year floodplain regulations. Outside of these restrictions, the human impacts created by the remaining activities are within acceptable levels of physical-biological changes for a RN ROS setting.

Access, more than any other factor, is the principal component in explaining variation in human impact (Ditton et al, 1977). A significant parallel was found between the research findings on the Rio Grande in Big Bend National Park, and the lower Jemez River study; regarding the influence of access on patterns of recreation use. Similar to the Lower Jemez River, the Rio Grande Study (Ditton et al, 1977) discovered that heavy site impacts developed in clusters, generally related to convenient access; i.e., close proximity to a paved road or special landscape attractions. By controlling the type and amount of access to an area, their research shows, the pattern of human impacts can best be manipulated and guided to acceptable standards for any particular recreational ROS setting. Several analyses will be done in this study to determine what is meant by acceptable levels, but the principal tool used to manipulate human impacts was access.

CHAPTER III

CHAPTER III: Critical Concerns/Affected Environment

Significant issues and concerns relevant to the project area, were generated from discussions held by the Santa Fe National Forest Interdisciplinary Team. The following list of concerns reflect only those items that the team felt were significant; to the project area.

1. Wildlife: threatened and endangered species prey habitat.

2. Water Quality: water quality and sanitation conditions related to human impacts.

3. Floodplain: development relative to the 100 year floodplain of the Lower Jemez River and stability of the stream channel.

4. Riparian zone: protection and enhancement of the riparian ecosystem.

5. Fisheries: potential for developing a trout fisheries along the Lower Jemez River.

6. Recreation: estimation of current user impacts and practical maximum ROS capacity, dominant user activities compatible with the landscape attractors, potential fishing access, and suitable development sites.

7. Soils: rates of erosion and loss of on-site soils.

The following concerns were determined to be, either of little significance to the proposed action and its effects on the environment, or mandatory must criteria which will be constant for every alternative considered.

Cultural: Protect all cultural resource sites.

Timber: Contains no currently commercial species.

Range: Not calculated in any allotments; some capacity is available.

Fire: Low fuels load/burning index/and risk to timber.

Land Uses: No discernable conflicts within or adjacent to the project.

Visual: Meet a Visual Quality Objective of Retention.

Economics: Final project must show a Benefit/Cost ratio (B/C) greater than 1.0.

Affected Environment

An inventory of the general condition of each critical resource concern is presented in the following sections. The descriptions of each are brief and only highlight the important points of each resource concern to the project proposal.

1. Wildlife: The entire lower Jemez River corridor is within the prey habitat of the threatened and endangered (T&E) peregrine falcon. By protecting the riparian habitat of the lower Jemez River, and thus the birds' prey, the number of available avian prey will at least be maintained or even increased over the status quo (Stahlecker, FSM 2670 9/10/80).

   The USFWS uses the American Peregrine Falcon Recovery Plan (Rocky Mountain/Southwest Populations) in their assessment of Peregrine Falcon impact. It requires that potential habitat be treated like occupied habitat. The recovery plan "prohibits disturbance and human activity

between February 1 and August 1 (in excess of those which historically occurred at the sites) which occur within one-half mile of the (birds habitat)." It also "prohibits land use practices and development which alter or eliminate the character of the hunting habitats within 10 miles of the nesting cliff."

Peregrine falcons have continued to hunt this area, even with the development of a very busy state highway. A point in favor of some limited development for recreation is that the human activity is located below, rather than above the cliffs, where most peregrine activity occurs. It is not known exactly what areas of the canyon are most important to the hunting birds, but it may be acceptable to have small developments at selected locations, if they concentrate present capacity (Stahlecker, FSM 2670: 9/10/80).

2. Water Quality: Monitoring of water quality will be required to assure compliance with State standards. Present trash and sanitation conditions have not yet produced quality results in known violation of State standards. It is not known what effect future use will have relative to compliance with the standards, but in general, some reduction in existing quality levels can be expected, if present use patterns continue.

3. Floodplain: Information supplied by the Army Corps of Engineers on the 100 year flood hazard boundary showed approximately one third of the potential recreation sites within the boundary line (Cunico; Corps of Engineers - 9/8/80). The accuracy of this information is sufficient for compliance with Executive Order 11988 on developments within the 100 year floodplain.

Those sites which were not in conflict with Executive Order 11988 are identified in Chapter IV (Figure 4). These sites were also identified as potential recreation sites in the Santa Fe FLMP (Figure 2a).

4. Riparian Zone:

The riparian plant community located within the project area is similar to the Wetland Formation class of Riparian Forest Formation (Hashisaki, 1981). These wetland communities have an overstory of trees greater than 35 feet tall and are frequently characterized by closed and/or multi-layered canopies. As is the case along the lower Jemez River, the common series in this formation is the Cottonwood - Willow series. Several very large cottonwoods are still scattered along the streambanks; survivors of previous intensive grazing practices by past ownerships. They now exert a commanding presence wherever they occur; becoming feature elements within this riparian landscape.

5. Fisheries:

At present the river possesses only average conditions for trout habitat. However, according to Region 3 Fisheries Biologist, Jerome A. Steffernd (FSM 2630; 12/22/81), the entire river and proposed project offers "an outstanding opportunity for meaningful work on a popular fishing area." Steffernd further stated that "correcting man caused deficiencies in fish habitat on the Lower Jemez will benefit many anglers by increasing the carrying capacity of the stream for trout."

The recommendations focused on methods to re-establish a meander pattern in the reach of the river. Methods; such as strategic placement of boulders, rock deflectors, and cabled tree deflectors, could be constructed to create the needed scour pools and meander patterns. Also, willows and cottonwoods could be planted along the stream banks; providing shade, bank stabilization, a food source for trout, and trout cover.

These recommendations are in the process of analysis and implementation within a parallel proposal by wildlife professionals within the Santa Fe National Forest and the New Mexico Game and Fish Department (NMGFD). Although there is concurrence on the assumption that the trout fisheries will increase, the actual percentage is still not known.

6. Recreation:

Recreation activities most commonly found within the project are, in the order of intensity; fishing, picnicking, camping, walking, swimming, photography, wildlife/landscape viewing, 'soleando', 'poleando', etc. Extensive access by vehicles occurs throughout the area, as evidenced by the numerous wheel tracks visible from aerial photographs and ground observation. The primary attractors are: (1) the deep pools and sand bars in the stream, (2) picturesque seasonal landscapes, and (3) large old cottonwood trees. Use appears heavy around the attractors and during weekends, with only sporadic fishing and day-use generally occurring during weekdays. More detailed use charcteristics are contained in Chapter IV.

7. Soils:

The soils within the project area have been classified as mapping units 4 and 113 (Santa Fe Soils Report, 1980). Mapping unit 4 corresponds to 0-15% slope lands within the riparian vegetation zone of the Lower Jemez River. (Santa Fe Soils Report, 1980) states that "moderate sheet and gully erosion is presently occurring in this unit. Erosion hazard is high due to position on the landscape. The presence of permanent water in this unit results in concentrated use by livestock" (also wildlife and human). This unit has a moderately rapid rate of permeability.

Mapping unit 113 corresponds to the steep slopes and benches bordering the Jemez River riparian zone. These soils support a vegetation of one-seed juniper with scattered pinyon pine. (Santa Fe Soils Report, 1980) states that the "erosion hazard is high on the soil componets of this unit. Presently moderate to severe gully erosion occurs in over half of the mapping unit." These soil conditions have severe limitations for carrying intensive uncontrolled dispersed recreation activities without adequate site protection measures.

These seven concerns, critical to the project area, are further developed in Chapter V as desirable evaluation criteria for a comparison of alternatives in Chapter VI.

CHAPTER IV

CHAPTER IV - Site Analysis/Use Capacity

As stated in Chapter I, the basic problem of finding a proper level of development, and management, for the lower Jemez River project area, points to the need for a reliable method for; (1) analyzing the lands suitability/capability to accommodate development, and (2) the actual current pattern of use and ROS practical maximum potential use for the area. Both of these problems must be resolved, before any plausible range of alternatives can be formulated.

A literature review provided some methodology for establishing appropriate capacity and use estimations, (Driver, 1975; and Clark/Stanley, 1979) but the approach used in this study is essentially unique in its' combination of techniques and assumptions. This study utilizes some of this research by approaching carrying capacity from the standpoint of ROS foundations; incorporating a code-a-side inventory (Hendee), spacing preferences (BOR 1977: Knudson, 1981, and Nash, 1978), activity/setting preferences (Driver, 1975; Downing, 1979; and Clark, 1979) and activity specialization (Bryan, 1979).

Site Analysis

A review of the entire project area was conducted to address the following identified issues and concerns:

1. Potential fisher person access points to the river (prefered distance is every ½-1 mile).

2. Adequate safe access on and off the highway to level areas suitable for a 5 car parking lot or more (areas identified in the Santa Fe FLMP).

3. Location of primary capital investment day-use facilities which are outside the 100-year floodplain.

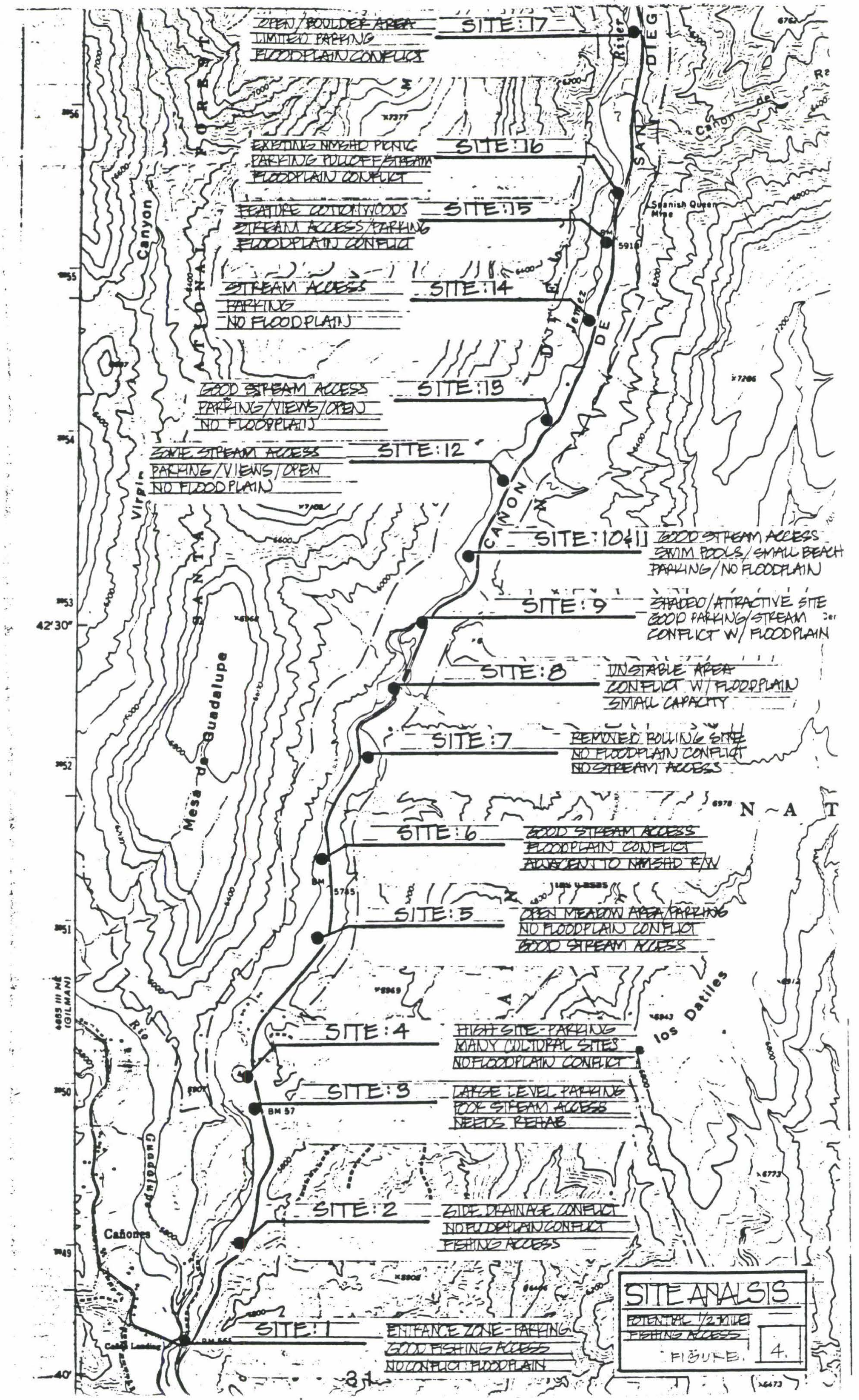
4. Location of primary attractors and features within the area (observed user preference for picnic/fishing/etc.).

5. Critical wildlife habitat zones (T&E peregrine falcon).

First, the entire project area was surveyed for potential sites which first met the criteria in concerns 1 and 2. In general, these were sites which had been previously delineated by the current and past users of the area. Second, identified user sites were examined against the criteria in concerns 3, 4, and 5 (Figure 4). Third, the 100 year floodplain line was calculated, using data supplied by the Forest Hydrologist. Fourth, the wildlife T&E zones were delineated using data supplied by the Forest and District Biologist. Finally, the location of primary attractors was conducted by an indepth field reconnaissance of landscape characteristics, and a documentation of observed general use patterns (vehicle tracks, fire rings, trails, garbage, etc.).

Use Capacities

The allowable time frame for the analysis, made it difficult to gain an indepth understanding of user characteristics and the detailed use patterns


SITE: 17
OPEN/BOULDER AREA
LIMITED PARKING
FLOODPLAIN CONFLICT
SITE: 16
EXISTING NMSHD PICNIC
PARKING PULLOFF/STREAM
FLOODPLAIN CONFLICT
SITE: 15
FEATURE COTTONWOODS
STREAM ACCESS/PARKING
FLOODPLAIN CONFLICT
SITE: 14
STREAM ACCESS
PARKING
NO FLOODPLAIN
SITE: 13
GOOD STREAM ACCESS
PARKING/VIEWS/OPEN
NO FLOODPLAIN
SITE: 12
SOME STREAM ACCESS
PARKING/VIEWS/OPEN
NO FLOODPLAIN
SITE: 10 & 11
GOOD STREAM ACCESS
SWIM POOLS/SMALL BEACH
PARKING/NO FLOODPLAIN
SITE: 9
SHADED/ATTRACTIVE SITE
GOOD PARKING/STREAM
CONFLICT W/ FLOODPLAIN
SITE: 8
UNSTABLE AREA
CONFLICT W/ FLOODPLAIN
SMALL CAPACITY
SITE: 7
REMOVED ROLLING SITE
NO FLOODPLAIN CONFLICT
NO STREAM ACCESS
SITE: 6
GOOD STREAM ACCESS
FLOODPLAIN CONFLICT
ADJACENT TO NMSHD R/W
SITE: 5
OPEN MEADOW AREA/PARKING
NO FLOODPLAIN CONFLICT
GOOD STREAM ACCESS
SITE: 4
HIGH SITE-PARKING
MANY CULTURAL SITES
NO FLOODPLAIN CONFLICT
SITE: 3
LARGE LEVEL PARKING
POOR STREAM ACCESS
NEEDS REHAB
SITE: 2
SIDE DRAINAGE CONFLICT
NO FLOODPLAIN CONFLICT
FISHING ACCESS
SITE: 1
ENTRANCE ZONE-PARKING
GOOD FISHING ACCESS
NO CONFLICT: FLOODPLAIN
Canyon
Jemez River
Spanish Queen Mine
Mesa de Guadalupe
Rio Guadalupe
Cañones
Los Datiles
Cañon de San Diego
42'30"
40'
SITE ANALSIS
POTENTIAL 1/2 MILE
FISHING ACCESS
FIGURE 4.

for the area. For example, it was not possible to apply a code-a-site inventory for the entire 9 miles of stream within the project area. Instead, a detailed study of a typical site within the project area, was used as a representative sample for the basic pattern and intensity of use occurring throughout the entire project area. Although each individual site is unique, a similiarity in access, vegetation, and the general characteristic of the landscape, exists throughout the project area. In addition, except for a few isolated private lands, the entire zone was classified as meeting the general criteria for a Roaded Natural (RN) Recreation Opportunity Setting (ROS).

Sites 1 and 2, and the entire riparian zone between them, was selected as the typical site for analysis. The area possesses a good variety of access, stream qualities, and has fairly level terrain. Utilizing some of the methodology from the code-a-site inventory approach, the site was mapped to show every fire ring/charcoal pit/vehicle track/and trail made by past users of the site. The results of this inventory are contained in Figure 5.

The map of inventoried sites and the 1 mile stretch of river in Figure 5 were then schematically graphed in Figure 6, to show a pattern and distribution of use intensity, relative to the river. Figure 6, gives an indication of various user spacing preferences relative to other sites and the character of the river. It is apparent in Figure 6 that even though the typical site contains about 58 acres of land, the primary area of use is located directly along the banks of the river.

The spacing and intensity of sites in clusters around the meander cut banks and deep pools of the river may have greater implications. The interval of the

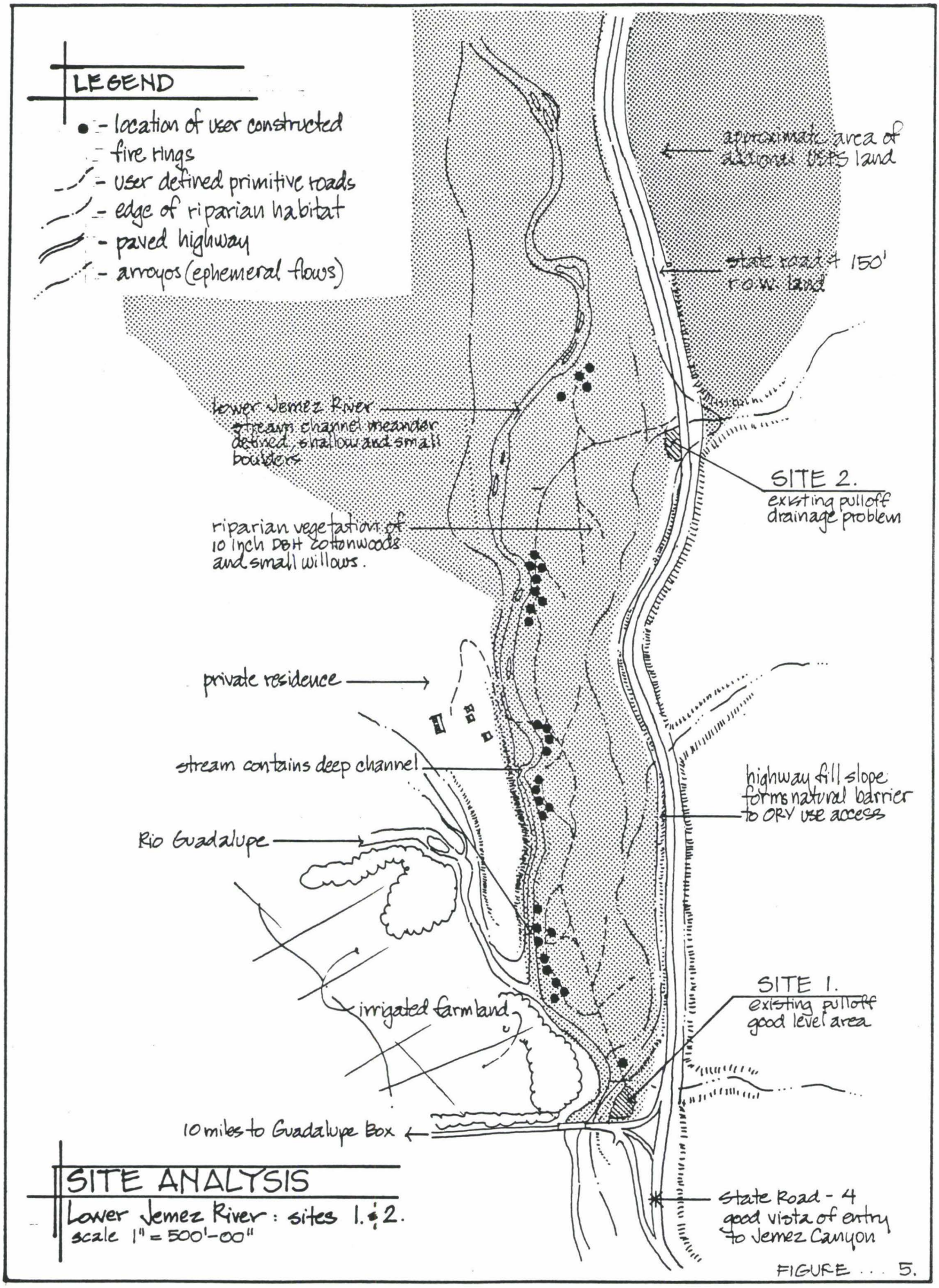
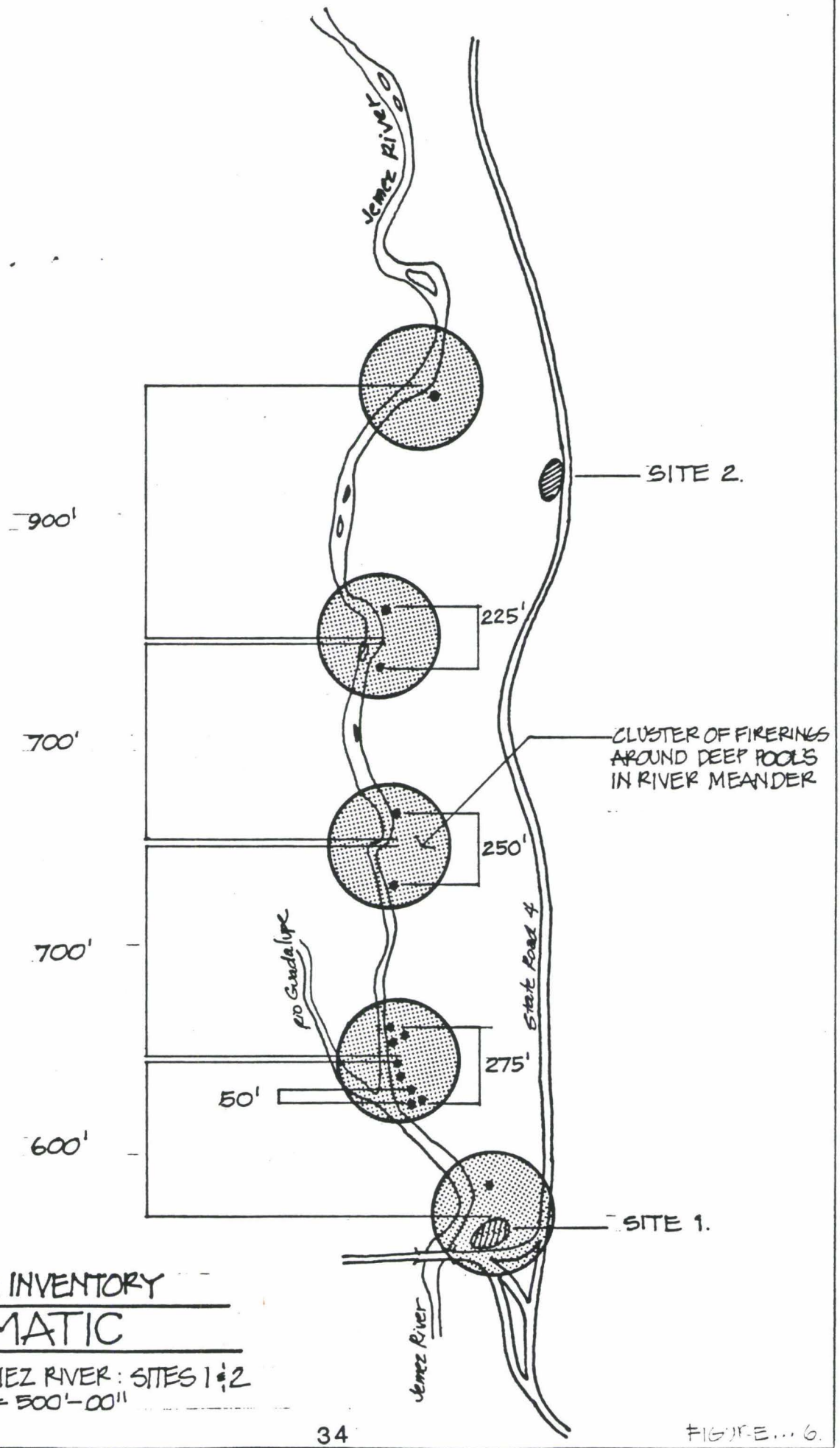

LEGEND
● - location of user constructed fire rings
- user defined primitive roads
- edge of riparian habitat
- paved highway
- arroyos (ephemeral flows)
approximate area of Arizona DOT land
state road + 150' r.o.w. land
lower Jemez River stream channel meander defined, shallow and small boulders
SITE 2.
existing pulloff
drainage problem
riparian vegetation of 10 inch DBH cottonwoods and small willows.
private residence
stream contains deep channel
highway fill slope forms natural barrier to ORV use access
Rio Guadalupe
irrigated farmland
SITE 1.
existing pulloff
good level area
10 miles to Guadalupe Box
State Road - 4
good vista of entry to Jemez Canyon
SITE ANALYSIS
Lower Jemez River: sites 1. & 2.
scale 1" = 500'-00"

FIGURE . . . 5.



SITE USE INVENTORY

SCHEMATIC

LOWER JEMEZ RIVER : SITES 1 & 2
SCALE 1" = 500'-00"

FIGURE... 6.

river meander seems to orient users at an average spacing of 700 feet between clusters, within which, sites are located on the average no closer than 50 feet apart. Sites on either end of the clusters are an average of 250 feet apart. It is hypothesized that these relationships represent a possible relfection of past ROS capacities, and distance preferences between different user activities.

In calculating an acceptable spacing distance for users involved in various activities, the following assumptions are drawn regarding the spacing requirement which best corresponds with the given ROS activity setting. The information in Table 4 summarizes the results of the analysis conducted on Sites 1 and 2.

Table 4. Spacing Distance by ROS Setting

Site 1 and 2 Spacing distance between fire rings and clusters	Theorized user preference relative to ROS setting expectations
700 feet (clusters)	first user patterns established equates to SPM/SPNM ROS setting.
200 feet (at attractor points)	basic patterns and spacing of use established by landscape attractors; forcing observers near attractors; equates to RN ROS setting.
50 feet (at attractor point)	maximum closeness to enjoy attractor; while still preserving a family units space needs: equates to R to U ROS setting.

These theorized user preferences, as they relate to ROS setting definitions, can then be further defined as the acceptable number of family visits at one

time (FAOT) for a particular activity, such as picnicking, that is necessary to maintain the desired ROS setting. Table 5 describes the number of picnicking families that could occupy the area between Sites 1 and 2, to meet these general social requirements for each ROS setting.

Table 5: Site 1 and 2 Typical Case Study

Spacing Between Fire rings/clusters	Number of families *(picnic) at one time (FAOT)	Theorized ROS Setting capacities
700 feet	5 family visits	SPM/SPNM
200 feet	10 family visits	RN
50 feet	30 family visits	R-U

*(a family unit equals 5 persons)

Using these assumptions, the Roaded Natural (RN) setting could then accept an average maximum density of 10 FAOT (picnicking) to achieve an appropriate social capacity. Since the assumption is based on actual site impacts, the data should be reliable for further application. The findings, then, will be later applied to a study of the probable mix of uses occurring on the site, and an approximate practical maximum use capacity within Sites 1 and 2.

The next step in determining the practical maximum ROS capacity of the typical area between Sites 1 and 2, is to study the dominant activities occurring in the area. District observations over the past three years indicates that the two most probable dominant activities are: fishing (general) and day use picnicking. In addition, a significant amount of self contained camper units and tent campers have been observed making single overnight stays within the project area.

The activity of picnicking includes several other activities such as: photography, walking, swimming, painting, etc. These activities are all summarized within the general activity of picnicking. Although some of the use may also extend into camping visits, it is difficult to isolate and will be handled separately; due to floodplain and wildlife considerations.

Fishing (general) is considered to be the most dominate use throughout the entire project area. As was explained in Chapter III, the New Mexico State Game and Fish Department (NMSGFD) describes the river as an excellent fisheries for fall/winter/spring stocking, and they will be proposing such a project within this section of the river. Fishing use, then, will be a primary activity, and will increase to levels higher than those occurring at present; once the stream is regularly stocked.

These theorizations and assumptions now provide a feasible basis for estimating the practical maximum ROS use capacity of the area between Sites 1 and 2. Table 6, briefly describes the process for determining this capacity.

Table 6: Process Summary

Typical Site Characteristics: Sites 1 and 2, Figures 4, 5, 6)

Size: 58 acres riparian
: 1 mile of stream
: 365 day managed season potential

Santa Fe National Forest ROS coefficient for Roaded Natural riparian areas
= *21.0 RVD/ac/M.S.
21 x 58 = 1218 RVD's (12 hour visits) Maximum potential
*(Santa Fe AMS, 1980)

This figure of 1218 RVD's is used as a basis of comparison for the following detailed analysis.

Average activity duration/visit (Region 3 Factors)

Activity	Hours	General Figure Used
Fishing	4.1	4
Picnicking	2.8	
Hiking/walking	3.6	5 (average combined total)
Water Play	1.8	
Camping	10.9	11

Average times of day occurring/activity: Time of Day

12 3 6 9 12 3 6 9 12

picnic/swim/photo/fish gen./hike/touring

fishing sp. fishing sp.

general trailer/car camping camping

To calculate average densities of users, by activity preferences, the following guidelines were applied from the 1977 BOR study:

1. BOR # of fisherman/mile - (ROS setting applied to each density)

RN: Fish/Wildlife Service	20 people/mile	= 260 feet apart
SPNM: (SCORP-low estimate)	1 person/mile	= 1 mile apart

The range of ROS user densities were then interpreted as:

RN - SPM range first estimate	5 people/mile	1000' apart
RN - R range first estimte	20 people/mile	260' apart

2. BOR # picnickers/acre = firering/acre (50' apart is the average urban density).

SPM - RN range first estimate 1 throwdown/3 acres
RN - R range first estimate 1 throwdown/acre
- - - - - - - - developed facility
R - U range first estimate 10/acre

Assumptions on preferences of potential users:

Fishing - highly accessible trout fisheries close to metro area; users would tolerate RN - R densities.

Picnicking - natural riparian/cottonwood area and pastoral picturesque setting: users would seek more intimate surroundings; tend to accept the SPM-RN range of densities.

The first calculation of capacity used the SPM-RN range of preferences for all activities (experimental run) as a trial comparison with the Santa Fe National Forest ROS coefficient of 21.0 RVD/ac/Managed Season.

Experimental Run:

Activities - RVD's/yr/58 acre site (typical)
-2 periods of 5 visits fishing = 40 hours/day x 365 = 6600 hrs. = 550 RVD's
4 hours each/365 days/yr.

-1 period of 10 visits picnic = 50 hours/day x 200 = 10,000 hrs = 833 RVD's
5 hours each/200 day*/yr.

The total for the typical site using SPM - RN ranges equals a capacity of 1383 RVD's.
*Reasonable season for picnic use in the area.

Compared with the original RN figure of 1218 RVD's this estimation is fairly close to the average capacity calculated for the Santa Fe Forest Plan ROS riparian capacity.

The difference in the lower Jemez River corridor is that it represents one of the most dense use zones on the Forest. Hence, it should be reasonable to expect a higher capacity than the average for the entire Forest. A second calculation is needed, though, which is in line with the original assumptions on user preferences by activity.

Preferred Run:

Activities - RVD's/yr/58 acre site (typical)

-2 periods of 20 visit/fishing = 160 hour/day x 365 = 58400 hrs = 4867 RVD's.
4 hours each/365 days/yr.

-1 period of 10 visit/picnic = 50 hours/day x 200 = 10,000 hrs. = 833 RVD's.

The total of the typical densities for RN capacity (activity preferences) equal [5700 RVD's]. This figure must now be adjusted to reflect the general occupancy rate of the typical area during the week. District personnel observations indicate that the ratio is approximately 1 visit per weekday for every 7 visits during the weekend. Thus, the adjusted ratio of 1:7 or a factor of 0.38* needs to be applied to our original figure to obtain a maximum practical potential capacity of [5700 x 0.38 = 2155 RVD's] (*ROS Users Guide). An important point to note, related to development needs, is that the same level of facilities is required to achieve 5700 RVD's, as are required for 2155 RVD's. The determining factor is the schedule of leisure time patterns, which are dictated by peoples work times. The five day work week, with an eight hour schedule, of 9-5, Monday - Friday, is reflected at a micro scale in the impacts on this typical site.

The analysis shows that for a Roaded Natural (RN) zone, this typical site, with use at 2155 RVD's, has a coefficient of 37.0 RVD/acre/managed season (MS), which is approximately double the guideline of 21.0 RVD/acre/MS established in the Santa Fe Land Management Plan. Though the physical setting may be in line with a Roaded Natural Zone, the social setting and managerial controls represent an inconsistency in the ROS setting. Table 7 explains the interaction of factors which has created this inconsistency.

Table 7: Inconsistencies

Management Factors	ROS Types of Settings P	SP NM	SP M	RN	R	U
Physical Access				X		
Other Uses				X		
Social Interaction					0	
Acceptable Impacts				0		
Regimentation of Management			0			

0 - These factors represent an inconsistency with the RN setting.

To maintain use at present levels, and still preserve the majority of the area in its existing Roaded Natural character, some small areas may need to be improved; changing some sites to a Rural (R) ROS setting with more use restrictions, in order to attract users away from the total extent of the riparian land area. To calculate the developed capacity needs, the entire area must first be given an approximation of practical maximum capacity based on the typical site example.

example focused on the need to accommodate overnight travelers in the lower Jemez Canyon (i.e. RV units: self contained camping vehicles). At the present time, much of this use is random; primarily concentrated along existing gravel pulloffs and user defined travelways leading to the river banks. District personnel have observed between 60-75 vehicles, during peak weekends in the summer, along the roadsides of State Road 4, or within the Lower Jemez project area.

The feasibility and resource suitability of concentrating RV use on sites within the project area, should be referenced to the original site analysis (Figure 4). Only Sites 5, 7, 10 and 12 lend themselves to an overnight facility; due to floodplain and contiguous acreage requirements. Hence, these will be the only areas suitable for overnight use within the corridor. Because of the relatively small size of each site, the overnight uses will not be considered as a primary use, but rather an added service for the primary daytime uses or public just passing through the area. Although, the new overnight facilities will provide some relief to the heavily used campgrounds (San Antonio and Redondo) in the Upper Jemez Canyon, the capability of these lower canyon sites is severely limited and will not be considered adequate to relieve these upper canyon sites. Other areas are identified in the Santa Fe FLMP to address the problems in the Upper Jemez Canyon.

Since overnight uses have been occurring in the same areas identified for day use facilities, an additional amount of RVD use will need to be included in the total RVD practical maximum capacity for the project area. This will be done by incorporating camping use as part of the calculation to determine the average length of time the area or site is occupied in hours (LOS).

Need for a New Management Concept

Though L&WCF acquisition funds were used to purchase these lands primarily for recreation purposes, it was also implied that they were to be used to preserve the integrity of such lands; including threatened and endangered species. It has been shown that the Lower Jemez River does serve as critical prey habitat for the peregrine falcon (T&E species). One of the basic concerns for the falcon is not to substantially increase the present levels of use, or development, within the falcons' prey habitat.

This unfortunately has already occurred, not only on the newly acquired Forest Service lands, but also on remaining private inholdings within the Jemez corridor. As the public becomes more aware of the water based opportunities offered by these public lands, and the NMSG&F develops the fisheries potential of the river, the extent of impacts to the entire corridor will inevitably increase. The result will be adverse impacts to the recreation ROS settings, as well as the prey habitat of the peregrine falcon.

The analysis presented in this chapter determined the maximum practical ROS capacity of the area to be 548 PAOT or [548 3.5 (Average number of persons/car)] = 157 parking spaces (includes NMSHD R/W lands). District observations of last years (1980-81) peak use was approximately 75-100 cars. The demand analysis showed that this use would increase by more than 65% by 1990 due to the development of regularly stocked fisheries and the intense demand in the southwest for water-based recreation opportunities (highest angler use per unit of water in the Nation, USDA Forest Service, Sport Fishing Resource, 1982). By 1990, the number of car parking spaces needed would be approximately 124 spaces (75x65%) or 434 PAOT (124x 3.5).

CHAPTER V - Evaluation Criteria and Formulation of Alternatives

Significant issues and concerns identified in Chapter III, are here redefined as desirable evaluation criteria. They will be used as a basis for comparing the alternative development proposals presented in this chapter.

Evaluation Criteria

1. Enhances wildlife habitats within the riparian zone.

2. Improves water quality conditions.

3. Locates heavy capital investment and overnights outside 100 year floodplain.

4. Improves peregrine falcon prey habitat.

5. Improves safe access to fisheries habitat.

6. Provides a balance between RN and R ROS water based recreation opportunities to meet population growth by 1990.

7. Reduces rates of erosion and loss of on-site soils.

Other Alternatives Considered

An alternative was considered for total closure of the project area to vehicle use (36 CFR 261.50); providing no additional developed facilities. This would

create heavy concentrations of parking along the shoulder of highly used State Road 4. Safety hazards would greatly increase, due to multiple pulloffs and activity close to the travel lanes. Also, this alternative would not adequately meet the original L&WCF purchase goals for the lower Jemez River; facilitating increased opportunities for dispersed recreation. In addition, it defers the entire Forest Service responsibility for managing the areas recreational use, to lands in other ownership; principally the State highway 4 right-of-way. The highway is designed as a travel corridor and is not suitable, or capable, of safely carrying the total recreation use of the river corridor within the right-of-way. For these reasons, this alternative will not receive further evaluation.

In addition, another alternative was considered to promote development of overnight facilities by other ownerships outside of the corridor. This is a viable alternative for both the Jemez Pueblo and the town of San Ysidro should they elect to provide such facilities. Efforts should continue in this direction through our land management planning process for accomodating a majority of the projected increases in recreation use for the entire Jemez Canyon. These private developments would directly benefit the traveling public, but would not specifically address the use of water based attractions along the lower Jemez Corridor. The main effect would be to reduce the need for managing the picnic areas for camper use; expanding the day-use options for all users of the river corridor. For these reasons, this alternative will be incorporated in the assessment for the final preferred alternative.

Formulation of Alternatives

Three alternatives are identified in the following sections which address part, or all of the significant issues and concerns raised in Chapter II, III and IV. The philosophy and proposed action for each alternative is briefly described. Refer to Figure 7 for the location of individual sites listed under alternatives 2 and 3.

Alternative No. 1: No Action

Should actually be stated as minimal action. Area would be managed for dispersed recreation with a minimum of signing: pack in/out signs, small forest entrance sign, open fires (except during extreme fire conditions), no limit or control on type of use (day or night); minor resource rehabilitation.

Alternative No. 2: Maximum Development

Attempts to handle all projected heavy use pressures in the lower Jemez Canyon corridor through a one time Forest Service site development for maximum individual site design potential PAOT capacity. All potential access sites to be developed and fee sites paved. Declared area of concentrated public use (36 CFR 261.50). Large Forest Entrance sign. Both day and overnight use accomodated. No private developments envisioned outside of the corridor to handle overnight use. 910 PAOT developed site capacity with parking areas on both Forest Service and NMSHD lands. Extensive rehabilitation and site controls.

Specific Proposals - Alternative 2.

NMSHD	FOREST SERVICE	Site Number Refer to Figure 7.	Sites Potential Maximum Number of Parking Units (3.5 PAOT/Unit	PAOT FOREST SERVICE	PAOT NMSHD
	X	1	14 picnic fishing	50	0
X		2	8 fishing	0	30
	X	3	25 fishing	90	0
	X	4	0	0	0
	X	5	25 picnic (camp fee)	90	0
X		6	25 fishing	0	90
	X	7	25 picnic (camp fee)	90	0
X		8	0	0	0
	X	9	10 picnic fishing	35	0
	X	10	25 picnic (camp fee)	90	0
	X	11	0	0	0
	X	12	20 picnic (camp fee)	70	0
	X	13	20 fishing	70	0
	X	14	20 fishing	70	0
	X	15	25 fishing	90	0
X		16	8 picnic fishing	0	30
	TOTAL MAXIMUM UNITS = (245 Units) (without adjustment for ROS Roaded Natural social carrying capacity considerations)		(750 Units)	750	160

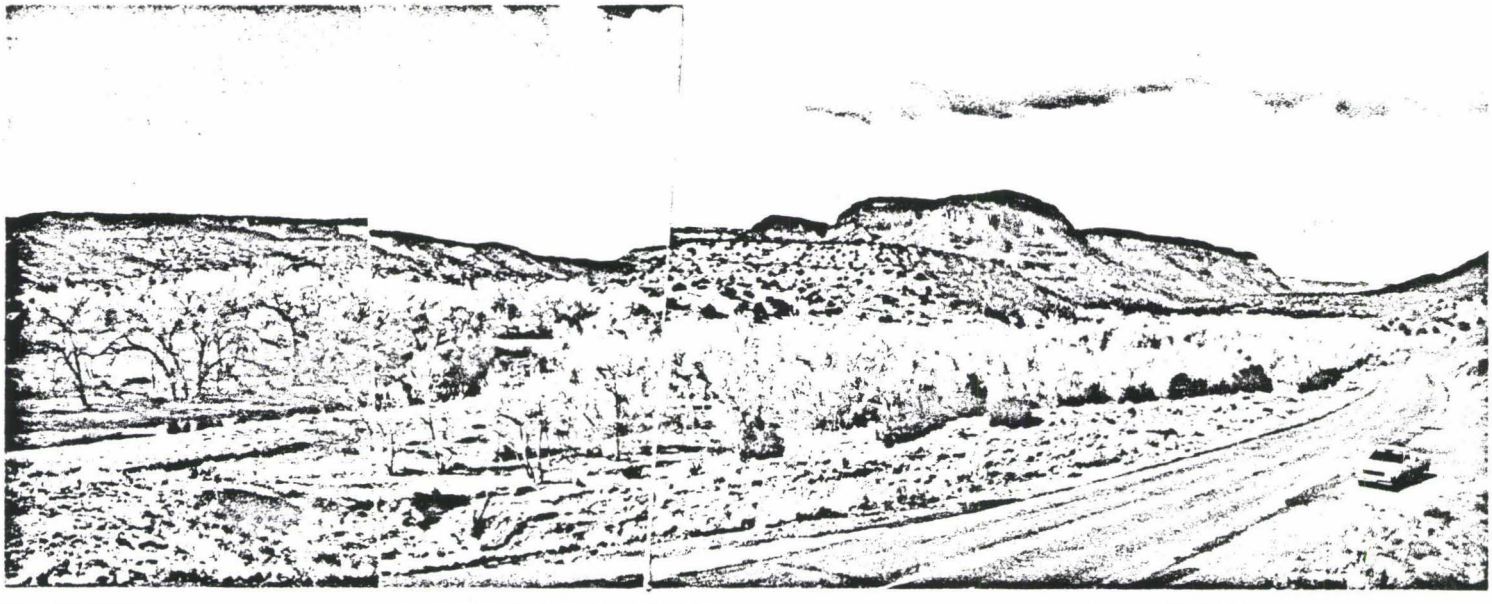
TOTAL PAOT CAPACITY = 910

Alternative No. 3. Intensively Managed Dispersed and Phased Semi-Developed Type Use

Attempts to balance developed Rural (R) ROS setting with existing Roaded Natural (RN) setting by phasing site development capacity. Phase I to meet Santa Fe FLMP demand by 1990 (435 PAOT). Phase II to meet total practical maximum PAOT capacity by 2010 (550 PAOT). Extend (36 CFR 261.50 restriction down canyon from Battleship Picnicground to Site No. 1. Day use area except for the three moderate size fee site areas which would allow seasonal camping as needed for district management. Several Fisherman lots; one paved, the remainder gravel. Forestwide planning to promote private overnight developments for increases in traveling public demands. Restrict vehicular access to undersignated site areas. Adequate signing to enforce use regulations. Trash recepticles at fee sites only; other sites to be on a pack in/out basis. Extensive rehabilitation of entire project area to be done on a continuing basis as soon as concept plan has been approved.

RECREATION MANAGEMENT PLAN
CAPITAL INVESTMENT PROJECT PROPOSAL

LOWER JEMEZ RIVER CORRIDOR



SANTA FE NATIONAL FOREST

JEMEZ RANGER DISTRICT

FLOYD A. THOMPSON III

1982

CAPITAL INVESTMENT PROJECT PROPOSAL
LOWER JEMEZ RIVER CORRIDOR

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Reviewed By:

ROBERT L. QUADE — Date
Forest Recreation & Lands Staff

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RECREATION MANAGEMENT FOR RIPARIAN/PEREGRINE FALCON HABITATS
LOWER JEMEZ RIVER CASE STUDY

JEMEZ RANGER DISTRICT

by

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Santa Fe National Forest
for
Completion of Requirements
Professional Development for Outdoor Recreation Managers
U.S. Forest Service, Short Course
Department of Recreation and Park Administration
College of Forest and Recreation Resources
Clemson University, Clemson, S.C.

Submitted
August 1982

The analysis shows that for a Roaded Natural (RN) zone, this typical site, with use at 2166 RVD's, has a coefficient of 37.0 RVD/acre/managed season (MS), which is approximately double the guideline of 21.0 RVD/acre/MS established in the Santa Fe Land Management Plan. Though the physical setting and managerial controls may be in line with a Roaded Natural Zone, the social setting represents an inconsistency in the ROS setting. Table 7 explains the interaction of factors which has created this inconsistency.

Table 7: Inconsistencies

Management Factors	ROS Types of Settings P	SP NM	SP M	RN	R	U
Physical Access				X		
Other Uses				X		
Social Interaction					O	
Acceptable Impacts				O		
Regimentation of Management			X			

O - These factors represent an inconsistency with the RN setting.

To maintain use at present levels, and still preserve the majority of the area in its existing Roaded Natural character, some small areas may need to be improved; changing some sites to a Rural (R) ROS setting in order to attract users away from the total extent of the riparian land area. To calculate the developed capacity needs, the entire area must first be given an approximation of current use, based on the typical site example.

The calculation of the practical maximum capacity potential of the entire project area, is based on the assumption that current user patterns and practical maximum capacities are closely interrelated and mutually important for maintaining the existing ROS setting. Considering the attractiveness of this area and the magnetic appeal of water in the Southwest, this is not an improbable assumption. Based on these assumptions, then, it will now be feasible to apply the typical site example to the entire stream length within the project area.

Developed Capacity Needs

The typical site examples' unadjusted capacity daytime use for 58 acres, or 1 mile of stream, is a total of 5700 RVD's/mile (no occupancy ratio). The Lower Jemez River within the project area, measures approximately nine miles. Thus, the following calculation is an attempt to estimate the practical maximum day use capacity for each dominant activity within the project area.

4867 (RVD's fishing) x 9 = 43,803 RVD's

833 (RVD's picnic) x 9 = 7,497 RVD's

51,300 RVD's - total day-use capacity for Roaded Natural ROS setting within Jemez corridor.

Developed Capacity Needs: Overnight Use

Another issue raised as part of the recreational concerns in the typical site example focused on the need to accommodate overnight travelers in the lower Jemez Canyon (i.e. RV units: self contained camping vehicles). At the present

time, much of this use is random; primarily concentrated along existing gravel pulloffs and user defined travelways leading to the river banks. District personnel have observed between 60-75 vehicles, during peak weekends in the summer, along the roadsides of State Road 4, or within the Lower Jemez project area.

The feasiblity and resource suitability of concentrating RV use on sites within the project area, should be referenced to the original site analysis (Figure 4). Only Sites 5, 7, 10 and 12 lend themselves to an overnight facility; due to floodplain and contiguous acreage requirements. Hence, these will be the only areas suitable for overnight use within the corridor. Because of the relatively small size of each site, the overnight uses will not be considered as a primary use, but rather an added service for the primary daytime uses or public just passing through the area. Although, the new overnight facilities will provide some relief to the heavily used campgrounds (San Antonio and Redondo) in the Upper Jemez Canyon, the capability of these lower canyon sites is severely limited and will not be considered adequate to relieve these upper canyon sites. Other areas are identified in the Santa Fe FLMP to address the problems in the Upper Jemez Canyon.

Since overnight uses have been occurring in the same areas identified for day use facilities, an additional amount of RVD use will need to be included in the total RVD practical maximum capacity for the project area. This will be done by incorporating camping use as part of the calculation to determine the average length of time the area or site is occupied in hours (LOS).

Total Development Capacity Determination

At this point, a total maximum capacity has been calculated for the project in units of Recreation Visitor Days (RVD's). These must now be adjusted to reflect the unique factors particular to use within the project area and then converted into capacity units or Persons at one Time (PAOT), for an estimation of needed facility development. The unique factors refer to: (1) the projects' estimated managed season of use, (2) the pattern-of-use, and (3) the average length of time the area is occupied in hours. The capacity units or (PAOT) is a unit of measure for calculating a theoretical maximum design capacity that is capable of handling the total projected PAOT for the project area. On the Santa Fe National Forest, recreation capital investment facilities are projected to accommodate a maximum of only 60% of this total PAOT need, in order to help maintain the longevity of these investments and to keep annual costs for operation and maintenance (O&M) to within 10% of facility replacement value (current year values).

The ROS Users Guide (1981) recently published by the USDA Forest Service, has the following formula for converting RVD's into PAOT units:

Table 8. RVD to PAOT Conversion

$$PAOT = \frac{RVD}{MS \times PU \times \frac{LOS}{12}}$$

Where:

MS = Managed Season of Use, in days;
PU = Pattern-of-Use, or the relationship between the average weekend use and average weekday use of sites and/or area;
LOS = Average length of time the area or site is occupied in hours.
12 = The Constant for 12 hours = RVD.

Each of the dominant activities for the lower Jemez River corridor (fishing, picnicking, and camping) are converted to PAOT units using this formula. Below are the calculatins for each activity:

1. Fishing RVD's = $\frac{43,803 \text{ RVD's}}{365 \times 0.45 \times \frac{8}{12}}$ = 400.0 PAOT

2. Picnic RVD's = $\frac{7,497 \text{ RVD's}}{200 \times 0.38 \times \frac{8}{12}}$* = 148.0 PAOT

3. Total development needs at 100% theoretical capacity = 548 PAOT.

*Average between (5 and 11 hours) picnic/camping - camping will be incorporated into the design capacity of Site 5, 7, 10 and 12.

This total theoretical design capacity [548 PAOT] is further adjusted to meet the general O&M guideline utilized by the Santa Fe National Forest of supplying ROS support development to meet 60% of the average annual user demand. Below are the adjusted PAOT capacities for each ROS activity group:

1. Fishing ROS opportuniteis = 400.0 PAOT x 1.66 = 664.0 PAOT

2. Picnic/camping ROS opportunities = 148.0 x 1.66 = 246.0 PAOT

3. Total development needs to meet 60% of theoretical design capacity = 910.0 PAOT

Summary of ROS Use Capacity

The total maximum development capacity for facilitating ROS opportunities within the lower Jemez River corridor is then [910.0 PAOT]. No additional amount of facilities should be contemplated, unless a significant change in the assumptions presented in the study are substantiated by more comprehensive research into user preferences.

Need for a New Management Concept

Though L&WCF acquisition funds were used to purchase these lands primarily for recreation purposes, it was also implied that they were to be used to preserve the integrity of such lands; including threatened and endangered species. It has been shown that the Lower Jemez River does serve as critical prey habitat for the of peregrine falcon (T&E species). One of the basic concerns for the falcon is not to substantially increase the present levels of use, or development, within the falcons' prey habitat.

This unfortunately has already occurred, not only on the newly acquired Forest Service lands, but also on remaining private inholdings within the Jemez corridor. As the public becomes more aware of the water based opportunities offered by these public lands, and the NMSG&F develops the fisheries potential of the river, the extent of impacts to the entire corridor will inevitably increase. The result will be adverse impacts to the recreation ROS settings, as well as the prey habitat of the peregrine falcon.

The analysis presented in the chapter determined the maximum practical ROS capacity of the area to be 910 PAOT or [910 ÷ 3.5 (Average number of persons/car)] = 260 parking spaces (includes NMSHD R/W lands). District observations of last years (1980-81) peak use was approximately 75-100 cars. The demand analysis showed that this use would increase by more than 65% by 1990 due to the development of regularly stocked fisheries and the intense demand in the southwest for water-based recreation opportunities (highest angler use per unit of water in the Nation, USDA Forest Service, Sport Fishing Resource, 1982). By 1990, the number of car parking spaces needed would be approximately 150 spaces (90x65%) or 525 PAOT (150x 3.5).

Based on these projections, a new management approach is needed to preserve the riparian values of this river corridor for all users (wildlife and man). The following Chapter V explores several alternatives for addressing these concerns.

CHAPTER V

CHAPTER V - Evaluation Criteria and Formulation of Alternatives

Significant issues and concerns identified in Chapter III, are here redefined as desirable evaluation criteria. They will be used as a basis for comparing the alternative development proposals presented in this chapter.

Evaluation Criteria

1. Enhances wildlife habitats within the riparian zone.

2. Improves water quality conditions.

3. Locates heavy capital investment and overnights outside 100 year floodplain.

4. Improves peregrine falcon prey habitat.

5. Improves safe access to fisheries habitat.

6. Provides a balance between RN and R ROS water based recreation opportunities to meet population growth by 1990.

7. Reduces rates of erosion and loss of on-site soils.

Other Alternatives Considered

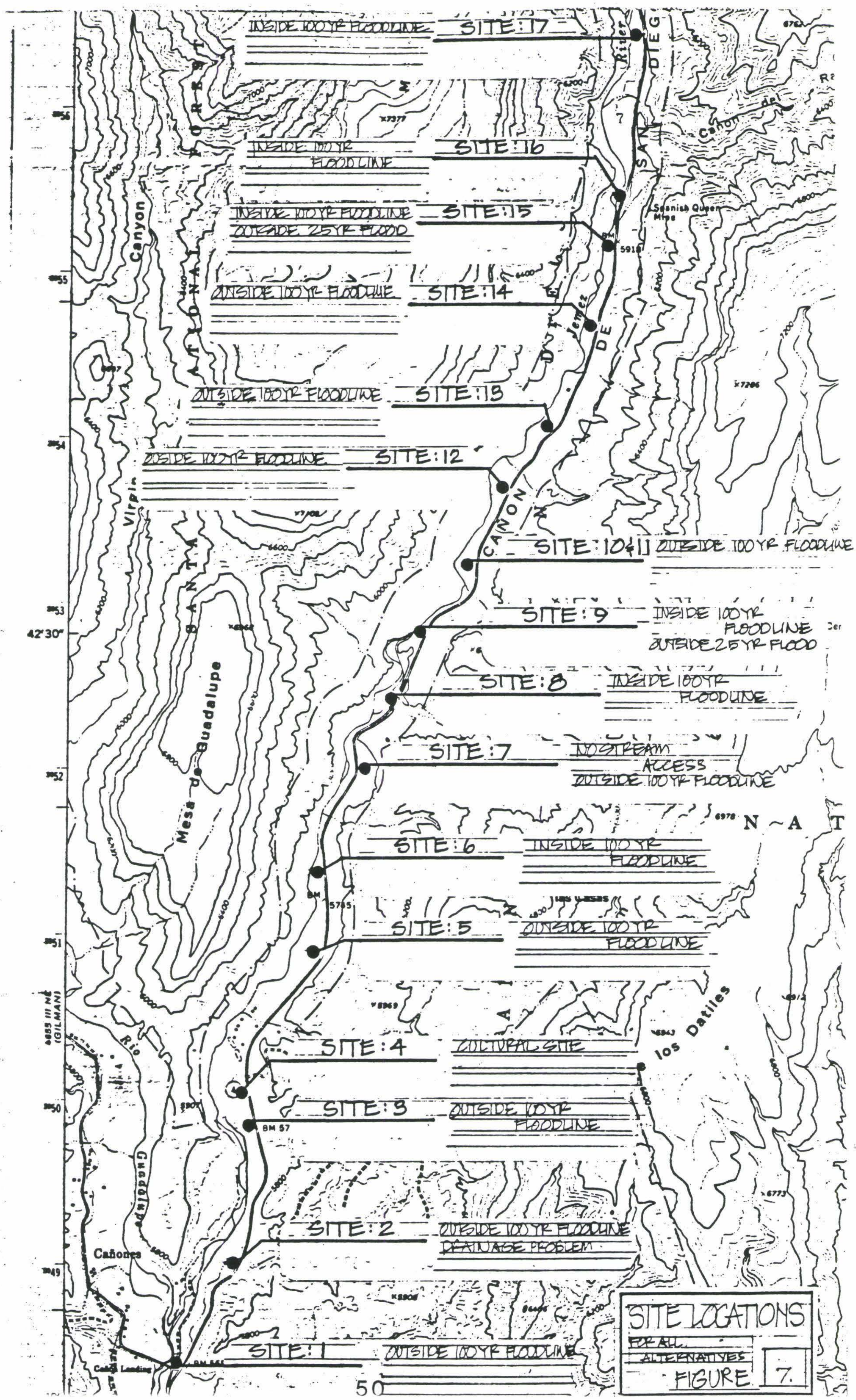
An alternative was considered to declare the entire area under a 36 CFR 261.50 "Area of concentrated public use" without any developments for day use or fee

sites for overnight use. Without any accompanying facility development, this alternative would not adequately address the extent of day-use, nor the environmental degradation occurring to the riparian habitat; subsequently, the alternative will not receive further evaluation.

An alternative was also considered for total closure of the project area to vehicle use; providing no additional developed facilities. This would create heavy concentrations of parking along the shoulder of highly used State Road 4. Safety hazards would greatly increase, due to multiple pulloffs and activity close to the travel lanes. Also, this alternative would not adequately meet the original L&WCF purchase goals for the lower Jemez River; providing increased opportunities for dispersed recreation. In addition, it defers the entire Forest Service responsibility for managing the areas recreational use, to lands in other ownership; principally the State highway 4 right-of-way. The highway is designed as a travel corridor and is not suitable, or capable, of safely carrying the total recreation use of the river corridor within the right-of-way. For these reasons, this alternative will not recieve further evaluation.

Formulation of Alternatives

Three alternatives are identified in the following sections which address part, or all of the significant issues and concerns raised in Chapter II, III and IV. The philosophy and proposed action for each alternative is briefly described. Refer to Figure 7 for the location of individual sites listed under alternatives 2 and 3.


SITE:17 INSIDE 100YR FLOODLINE
SITE:16 INSIDE 100YR FLOODLINE
SITE:15 INSIDE 100YR FLOODLINE OUTSIDE 25YR FLOOD
SITE:14 OUTSIDE 100YR FLOODLINE
SITE:13 OUTSIDE 100YR FLOODLINE
SITE:12 OUTSIDE 100YR FLOODLINE
SITE:10&11 OUTSIDE 100YR FLOODLINE
SITE:9 INSIDE 100YR FLOODLINE OUTSIDE 25YR FLOOD
SITE:8 INSIDE 100YR FLOODLINE
SITE:7 NO STREAM ACCESS OUTSIDE 100YR FLOODLINE
SITE:6 INSIDE 100YR FLOODLINE
SITE:5 OUTSIDE 100YR FLOOD LINE
SITE:4 CULTURAL SITE
SITE:3 OUTSIDE 100YR FLOODLINE
SITE:2 OUTSIDE 100YR FLOODLINE DRAINAGE PROBLEM
SITE:1 OUTSIDE 100YR FLOODLINE
Canyon
Virgin
SANTA
Mesa de Guadalupe
CANON DE SAN DIEGO
Jemez River
Spanish Queen Mine
los Datiles
Cañones
Rio Guadalupe
Cañon Landing
42'30"
SITE LOCATIONS FOR ALL ALTERNATIVES
FIGURE 7.

Alternative No. 1: No Action

Should actually be stated as minimal action. Area would be managed for dispersed recreation with a minimum of signing: pack in/out signs, small forest entrance sign, open fires (except during extreme fire conditions), no limit or control on type of use (day or night); minor resource rehabilitation.

Alternative No. 2: Maximum Development

Attempts to handle all projected heavy use pressures in the lower Jemez Canyon corridor through a one time site development for maximum PAOT capacity. All potential access sites to be developed and fee sites paved. Declared area of concentrated public use (36 CFR 261.50). Large Forest Entrance sign. Both day and overnight use accomodated. 750 PAOT Forest Service developed site capacity with parking areas on both Forest Service and NMSHD lands. Extensive rehabilitation and site controls.

Specific Proposals - Alternative 2.

NMSHD	FOREST SERVICE	Site Number Refer to Figure 7.	Maximum Number of Parking Units (3.5 PAOT/Unit	PAOT FOREST SERVICE	PAOT NMSHD
	X	1	14 picnic fishing	50	0
X		2	8 fishing	0	30
	X	3	25 fishing	90	0
	X	4	0	0	0
	X	5	25 picnic (camp fee)	90	0
X		6	25 fishing	0	90
	X	7	25 picnic (camp fee)	90	0
X		8	0	0	0
	X	9	10 picnic fishing	35	0
	X	10	25 picnic (camp fee)	90	0
	X	11	0	0	0
	X	12	20 picnic (camp fee)	70	0
	X	13	20 fishing	70	0
	X	14	20 fishing	70	0
	X	15	25 fishing	90	0
X		16	8 picnic fishing	0	30
	TOTAL MAXIMUM UNITS = 245 Units		750	160	
			TOTAL PAOT CAPACITY = 910		

Alternative No. 3. Intensively Managed Dispersed and Phased Semi-Developed Type Use

Attempts to balance developed Rural (R) ROS setting with existing Roaded Natural (RN) setting by phasing site development capacity. Phase I to meet Santa Fe FLMP demand by 1990. Phase II to meet total practical PAOT capacity by 2000. Extend (36 CFR 261.50 restriction down canyon from Battleship Picnicground to Site No. #1. Day use area except for the three moderate size fee site areas which would allow camping. Several Fisherman lots; one paved, the remainder gravel. Approximate PAOT for Phase I = 535. Restrict vehicular access to undesignated site areas. Proper signing. Trash recepticles at fee sites only; other sites to be on a pack in/out basis. Extensive rehabilitation of entire project area.

Specific Proposals - Alternative 3.

NMSHD	FOREST SERVICE	Site Number Refer to Figure 7.	Maximum Number of Parking Units (3.5 PAOT/Unit	PAOT CAPACITY PHASE I FOREST SERVICE	(Rounded to nearest 5 PAOT NMSHD	Phase II FOREST SERVICE	NMS
	X	1	14 picnic fishing	50	0	0	0
X		2	8 fishing	0	20	0	10
	X	3	25 fishing	45	0	45	0
	X	4	0	0	0	0	0
	X	5	25 picnic camp fee	90	0	0	0
X		6	25 fishing	0	35	0	65
X	X	7	25 picnic camp	0	0	90	0
X		8	0	0	0	0	0
	X	9	10 picnic fishing	25	0	15	0
	X	10	25 picnic camp	90	0	0	0
	X	11	0	0	0	0	0
	X	12	20 picnic camp fee	35	0	35	0
	X	13	20 fishing	35	0	35	0
	X	14	20 fishing	35	0	35	0
	X	15	25 fishing	45	0	45	0
X		16	8 picnic fishing	0	30	0	0

TOTAL MAXIMUM UNITS = 245 Parking Units

PHASE I = 535 PHASE II = 375

TOTAL MAXIMUM PAOT = 910.0 PAOT

CHAPTER VI

CHAPTER VI.

Effects of Implementation

The alternatives are compared against the evaluation criteria and the probable effects described in narrative form.

Alternative 1

Uncontrolled vehicle and camping use will increase the rate of environmental degradation to vegetative riparian cover, wildlife habitats, and water quality. Increased degradation will ultimately lead to higher soil erosion rates; causing further impacts to the water quality and related fisheries habitat. Law enforcement problems may be further aggravated by extensive site occupancy, and a general atmosphere of uncontrolled use. The entire riparian zone will be heavily impacted as increasing numbers of users are attracted to the water-based activities and newly developed trout fisheries. Peregrine falcon habitat within the riparian zone will receive increased intrusions by all types of motorized users, both in extent of area effected and the intensity of impact.

The social carrying capacity of the area will far surpass the RN ROS setting creating the appearance of a R ROS setting without providing the support developments of toilets and maintained sites to diminish resource degradation. Overnight camping will occur within the 25 as well as the 100 year floodplain; causing potential safety hazards during times of high probability for flash floods.

Present Net Value = $7,406,857.00

Benefit/Cost Ratio = 340.0 : 1.0 (Appendix C)

Alternative 2

Heavy site controls and the immediate implementation of full site development (910 PAOT) will reduce much of the vehicular caused impacts to the resource, but the magnitude of the development will create such an attraction, that increased non-motorized activities as well as motorized activities within the area may far exceed an acceptable rate of change to meet the maximum RN ROS carrying capacity levels for the riparian zone. In addition, the development will far exceed the facility support needs, based on the identified probable demand by 1990. The lower B/C ratio reflects the over development for identified demand.

The effect of such a quantum increase in development level may have a negative effect on the prey habitats of the peregrine falcon. The premature full capacity development may be too much of a change in user congestion, noise levels, and duration of use for the falcon. In general, the corridor will have been fully developed to maximum capacity, at a rate which may cause significant impacts to the prey habitat of the falcon.

Present Net Value: $9,578,591.00

Benefit/Cost Ratio: 6.79 : 1.0

Alternative 3

The moderate amount of user controls and a phasing of site development (Phase I = 535/Phase II 375 PAOT) will accommodate the projected demand to 1990 and phase in facilities up to the practical maximum capacity of 910 PAOT by 2007

(will require NMSHD assistance). Water-based recreation use will undoubtably increase more than the rate of population growth, but premature increases in developed facilities to attract more users to the area, is not in line with the monitoring and management requirements of the peregrine falcon. The development of the R ROS settings will be sufficient to handle average vehicle use capacity and preserve the remainder of the area as a RN ROS setting. Provision of toilets and water at the designated fee sites should adequately handle sanitation needs and help to improve the water quality condition. Overnight stays will be limited to fee-sites only, which are outside the 100 year floodplain zone. A sufficient number of gravel parking lots for fisherman access will be located outside of the highway right-of-way, at approximately one mile intervals along the river corridor.

Present Net Value: $8,796,419.00

Benefit/Cost Ratio: 9.48 : 1.0

CHAPTER VII

CHAPTER VII.

Identification of the Preferred Alternative

Alternative 3 is the preferred alternative.

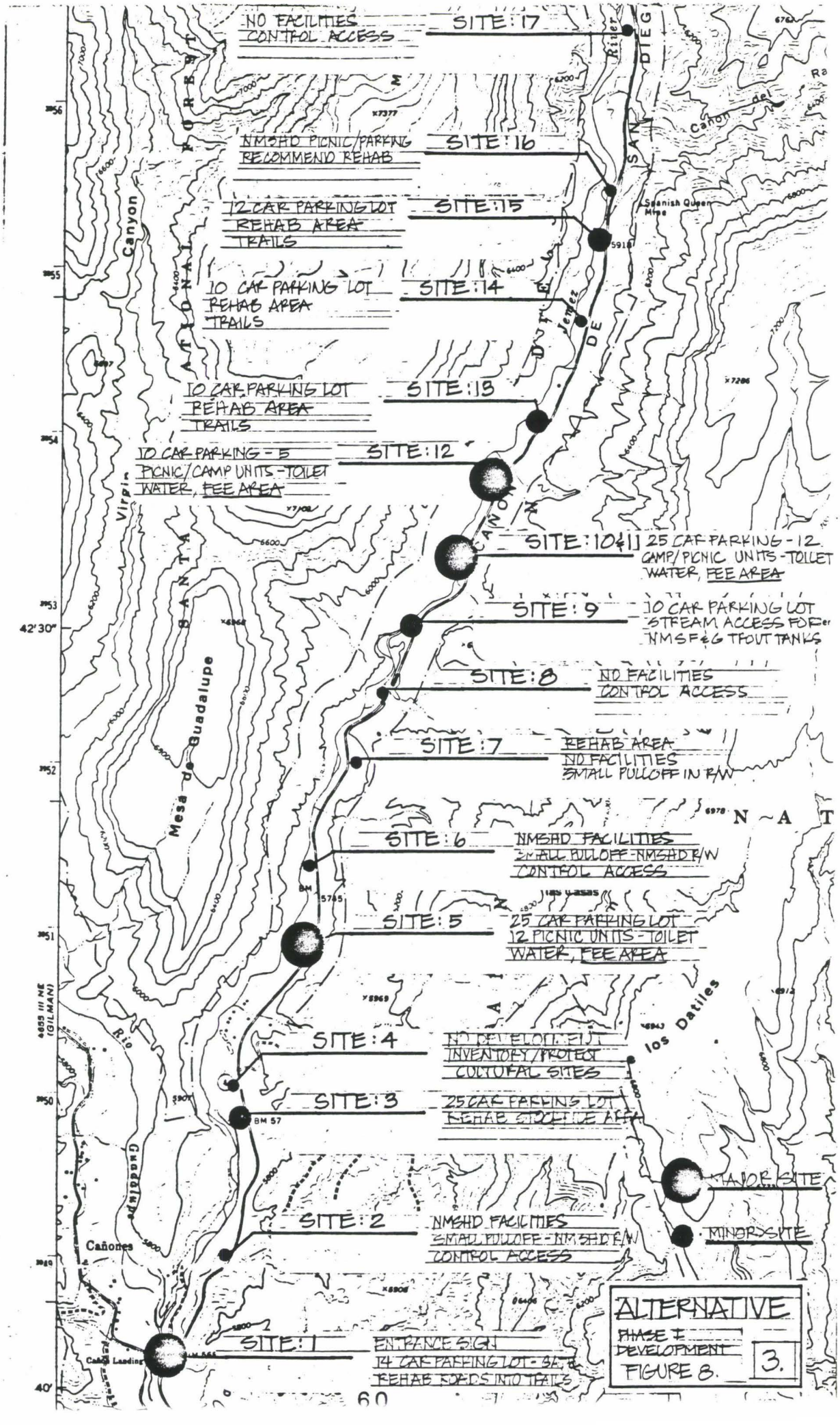
Alternative 3 provides the best development scheme for meeting the primary ROS setting demands, while minimizing impacts to the existing RN ROS setting and the critical prey habitat needs of the peregrine falcon.

The provision of well designed developed facilities at a few selected locations and control of motorized access will substantially reduce the extensive impacts presently occurring within the entire project area. The increased attractiveness of the corridor will benefit both passing motorists and site users alike. Major overnight developments are located outside of the 100 year flood plain; improving the health and safety of potential users. The three developed fee sites will provide a safe location for picnickers/campers to enjoy an open fire during fire restrictions which occur frequently in the Jemez Mountains during the summer months. The several semi-developed fisherperson parking areas allow for easy frequent access to the river for all types of non-motorized water-based recreation activities. The Phase I development should be a well timed improvement to the entire corridor; providing increased benefits to the local tourist industry as well as expanded water based recreation opportunities to the Albuquerque Metropolitan area.

Project Proposal:

The site development concept for Alternative 3, Phase I, is presented in Figure 8. Detailed explanations of material quantities, scheduled work, and

estimated costs are contained in, Appendix C: Economic Analysis of Alternatives. Schematic site concept plans for the paved and fee site locations are contained in Appendix B. (Sites 1, 5, 10/11 and 12).


SITE: 17
NO FACILITIES
CONTROL ACCESS
SITE: 16
NMSHD PICNIC/PARKING
RECOMMEND REHAB
SITE: 15
12 CAR PARKING LOT
REHAB AREA
TRAILS
SITE: 14
10 CAR PARKING LOT
REHAB AREA
TRAILS
SITE: 13
10 CAR PARKING LOT
REHAB AREA
TRAILS
SITE: 12
10 CAR PARKING - 5
PICNIC/CAMP UNITS - TOILET
WATER, FEE AREA
SITE: 10&11
25 CAR PARKING - 12
CAMP/PICNIC UNITS - TOILET
WATER, FEE AREA
SITE: 9
10 CAR PARKING LOT
STREAM ACCESS FOR
NMSF&G TROUT TANKS
SITE: 8
NO FACILITIES
CONTROL ACCESS
SITE: 7
REHAB AREA
NO FACILITIES
SMALL PULLOFF IN R/W
SITE: 6
NMSHD FACILITIES
SMALL PULLOFF - NMSHD R/W
CONTROL ACCESS
SITE: 5
25 CAR PARKING LOT
12 PICNIC UNITS - TOILET
WATER, FEE AREA
SITE: 4
NO DEVELOPMENT
INVENTORY/PROTECT
CULTURAL SITES
SITE: 3
25 CAR PARKING LOT
REHAB SHOOTING AREA
SITE: 2
NMSHD FACILITIES
SMALL PULLOFF - NMSHD R/W
CONTROL ACCESS
SITE: 1
ENTRANCE SIGN
14 CAR PARKING LOT - SE
REHAB ROADS INTO TRAILS
MAJOR SITE
MINOR SITE
ALTERNATIVE
PHASE I
DEVELOPMENT
FIGURE 8.
3.
Santa Fe National Forest
Canyon
Virgin
Mesa de Guadalupe
Rio Cañones
Cañones
Los Piños
Los Datiles
Canon del Rio
Spanish Queen Mine
Cañon de Jemez
BM 5765
BM 57
Cañon Landing
42°30'
40'
60

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APPENDICES

A

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

Jemez R.D.
Jemez Springs, New Mexico 87025

REPLY TO: 2314 Recreation Management August 26, 1977

SUBJECT: Recreation Management Composite - Jemez Canyon

TO: Forest Supervisor

Recreation use on the Jemez District has increased steadily over the past years, 278% since 1969. This trend is expected to increase.

Of particular concern is the impact on the Jemez Canyon from Soda Dam to La Cueva. This area would extend to Canon if the Walsh Properties were acquired through purchase.

Management Direction and Objectives need to be defined along with public needs both present and future for the entire Jemez Canyon. Perhaps the best way to accomplish this is through a recreation management composite plan.

I would like to identify major concerns by area starting with the Walsh Properties and proceeding north.

1. Walsh Properties

   This property is undeveloped for recreation purposes but receives heavy fishing and dispersed use. The public has unlimited access to the Jemez River from State Highway #4.

   This unlimited access and sanitation problems are of major concern. Construction of recreation facilities is questionable due to the flood plane of the Jemez River.

2. Jemez Ranger Station

   No rest stops are available between Albuquerque and Jemez Springs Ranger Station. Consequently we are furnishing restroom facilities for the general public including bus loads of school children.

   The facilities at the ranger station were not designed to handle these impacts.

   In addition there is a continuous interruption of the office staff doing nothing but direction of traffic to the rest rooms.

3. Soda Dam

   We are in the final stages of acquiring this property. The only facilities presently available are state owned garbage cans.

   Safety both on State Highway #4 and from walking on the dam is of major concern.

From this we can then develop management directions for the entire canyon.

Mark D Shultch

For CHARLES E. McGLOTHLIN
Jemez District Ranger

UNIT STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Santa Fe NF

REPLY TO: 2310 Recreation System Planning October 10, 1977

SUBJECT: Jemez Canyon Recreation Management/Introductory Field Trip

TO: Robert L. Quade, Recreation & Lands Staff Officer

On Sept. 1, 1977, I toured recreation sites located in the Jemez Canyon with Charles Shields, Jemez District R&L Staff. This field trip was in response to a memo from the District requesting assistance in Recreation Planning for the Jemez Canyon Area. The purpose was to introduce me to some of their recreation management problems.

Following are the sites visited and the major items discussed, including my observations & initial thoughts:

1. Walsh Properties

As I understand, this property will be purchased in segments over the next few years. Purchase of this property will provide public ownership on several miles of the Jemez River south of Jemez Springs. Due to the proximity of the stream to State Highway 4, there is and will be heavy fishing & dispersed use along the stream. Primary management concerns relate to this unlimited access as well as sanitation problems that will occur as a result of the heavy use.

Capabilities for the construction of recreation developments is low for most areas of this property as much of it is in the flood plain zone of the Jemez River. Initial observations indicated a few benches adjacent to the highway that would support day use developments such as parking areas, perhaps some picnic units and related facilities that include trail access to the stream, toilets, and refuse containers. The potential for overnight developments is low if it exists at all and I feel the primary management emphasis should be toward day use activities.

2. Jemez Ranger Station

The Ranger Station is receiving heavy recreation impacts in the form of furnishing restroom facilities for the general public, answering recreation inquiries from visitors, completing chainsaw inspections, and filling out christmas tree permits, etc.

We did not observe any of the recreation developments on the District that were located outside Jemez Canyon. However, I have had previous opportunity to visit most of these sites and am aware of other management problems, especially at Jemez Falls. I would suggest that any recreation studies completed on the Jemez District include all the recreation sites and not be confined to the Jemez Canyon.

In addition, study of & resulting composite plans for recreation sites on the Jemez District should be under an overall Forest Recreation Resource Management Plan. We have already attempted to relate proposed recreation developments on the Cuba District with management situations on the Jemez District. We have also discussed the need for the Forest Recreation Management Plan and again, I feel this should be a top priority in our recreation planning efforts. Although we could probably take on 1 or 2 selected areas for specific study, this should be the limit until we have established an overall framework to guide and coordinate our recreation planning.

Tom Kokx

TOM KOKX
Landscape Architect

cc:Kokx

pea

HERITAGE CONSERVATION AND RECREATION SERVICE
WASHINGTON, D.C. 20240

IN REPLY REFER TO:

Mr. John R. McGuire
Chief, Forest Service
Department of Agriculture
Washington, D. C. 20250

Dear Mr. McGuire:

We have reviewed the data on the Jemez Canyon Composite, Santa Fe [illegible] Forest, submitted by Region 3, Forest Service.

The New Mexico SCORP indicates a need in State Planning Region 3, which includes Jemez Canyon, for camping and picnicking units as well as [illegible] recreation type activities. The development plan for Jemez Canyon [illegible] immediate development for dispersed recreation, and for development of camping and picnicking areas sometime in the future. The reason for development of dispersed areas is to alleviate the heavy use [illegible] is degrading the camping and picnicking sites. Acceleration of the development schedule is urged so that the camping and picnicking needs can be satisfied in a more timely fashion, and thus further reduce any [illegible] existing developed sites.

In accordance with our agreement on "Joint Instructions for Comprehensive Planning," we approve the Jemez Canyon Composite for funding with [illegible] Water Conservation Fund monies as it represents a viable recreation [illegible] that will provide many recreation opportunities.

Sincerely,

Chris Therral Delaney
Director

LANDS STAFF

JUL 10 1976

Director _____
Dep. Dir. _____
Assoc. _____
A. D. E. _____
Adm. Asst. _____

Enclosure
Composite Approval Sheet

19.

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

Santa Fe National Forest

REPLY TO: 2310 Recreation System Planning

July 11, 1980

SUBJECT: I.D. Team Review Request of Soda Dam and the Lower Jemez Canyon Recreation Development Proposals

TO: District Ranger, Jemez Ranger District

On July 1, 1980, Louise Odegaard and I examined the feasibility of developing new recreation facilities for picnicking, camping, interpretation, and fisher person access on the newly acquired Walsh properties in the lower Jemez Canyon. All potential sites were inspected and analyzed for their feasibility to handle different recreational developments. A preliminary schematic concept was created based on our initial data; offering a broad spectrum of recreational opportunities. We feel the area should have a high cost/benefit ratio for consideration in the overall selection of Regional Capital Investment Projects due to its:

1. close proximity to the major metropolitan area of Albuquerque by paved State Roads (within 1 hour driving time).

2. potential for a 365 day season which could offer a variety of uses (dispersed RV camping, developed picnic, swimming, fishing, and scenic/historic interpretation).

3. highly desirable distinctive landscape qualities of a riparian stream environment surrounded by monumental geologic formations; offering a high potential for good fisheries habitat improvement through resource protection and design.

To complete the Capital Investment EA by October 1, 1980, for submittal to the Regional Office, the project will require an I.D. Team review of the area sites within the next two weeks. It is recommended that the team at a minimum include the Forest Wildlife Biologist, Soils Scientist, Hydrologist and Landscape Architect with a Construction and/or Facilities Engineer, whichever is available. The I.D. Team Review should also include a visit to the Soda Dam site to analyze the impacts of our proposed development plans, if, and when we acquire the 5 acre tract North of the dam. The Soda Dam project is also targeted for a submittal date of October 1, 1980, provided negotiations with the landowners proceed favorably.

2/2310/Jemez District Ranger/7-11-80

A map of the sites to be visited and the initial development concept for the lower Jemez Canyon area is enclosed for your review and use in the request for the I.D. Team review. The Soda Dam project can be explained using our present preliminary concept sketches, at the Ranger Station before visiting the site.

If an additional prospectus sheet is required to orient the I.D. Team to these two sites, please contact me and I will draft such a letter to the individual I.D. Team Members. I am available at anytime for any other questions you might have.

FLOYD A. THOMPSON
Forest Landscape Architect

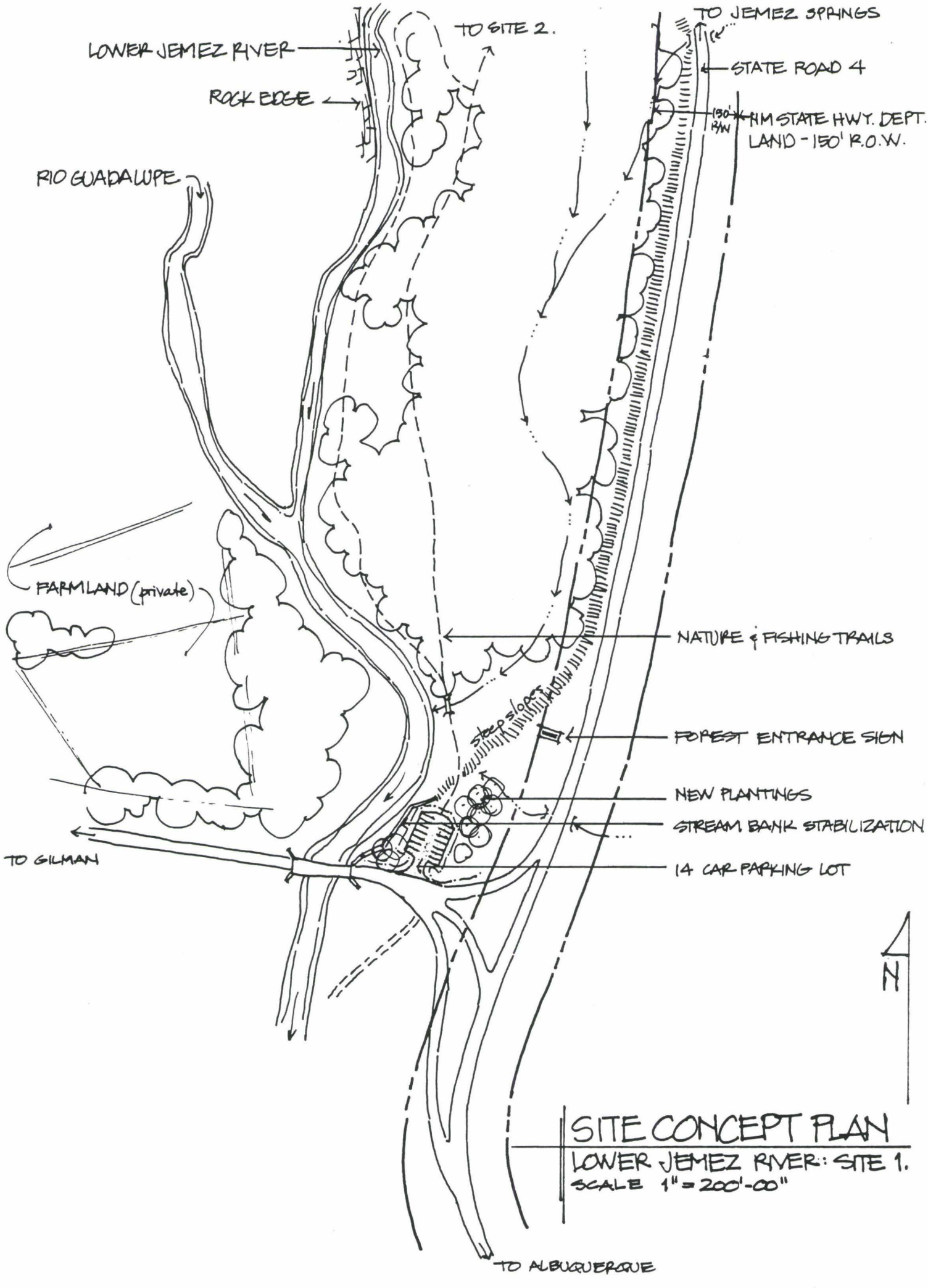
Enclosure

cc: Floyd Thompson
Joe Quade

rv

B

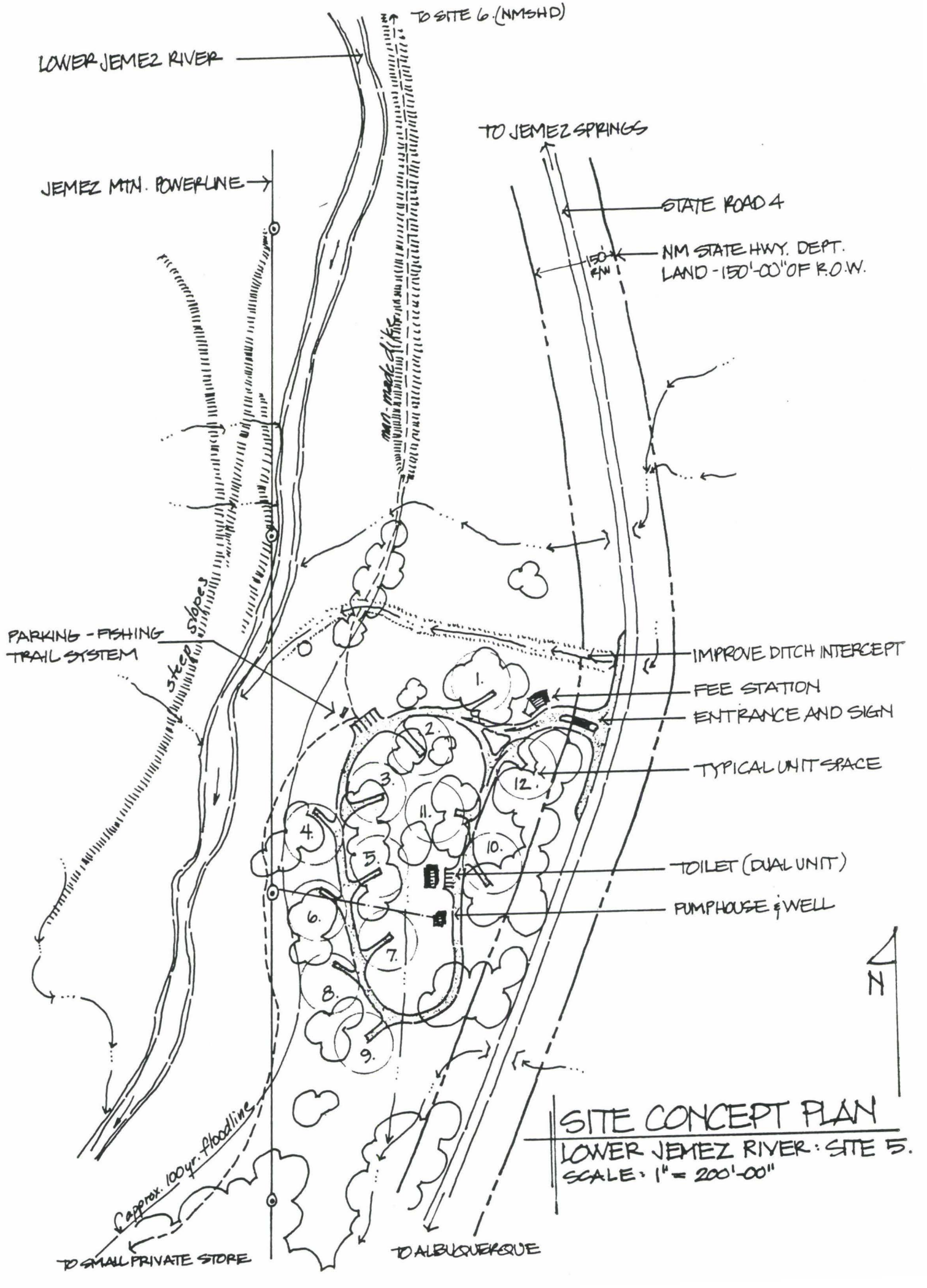
Site Concept Plans - (Sites 1, 5, 10/11, and 12)

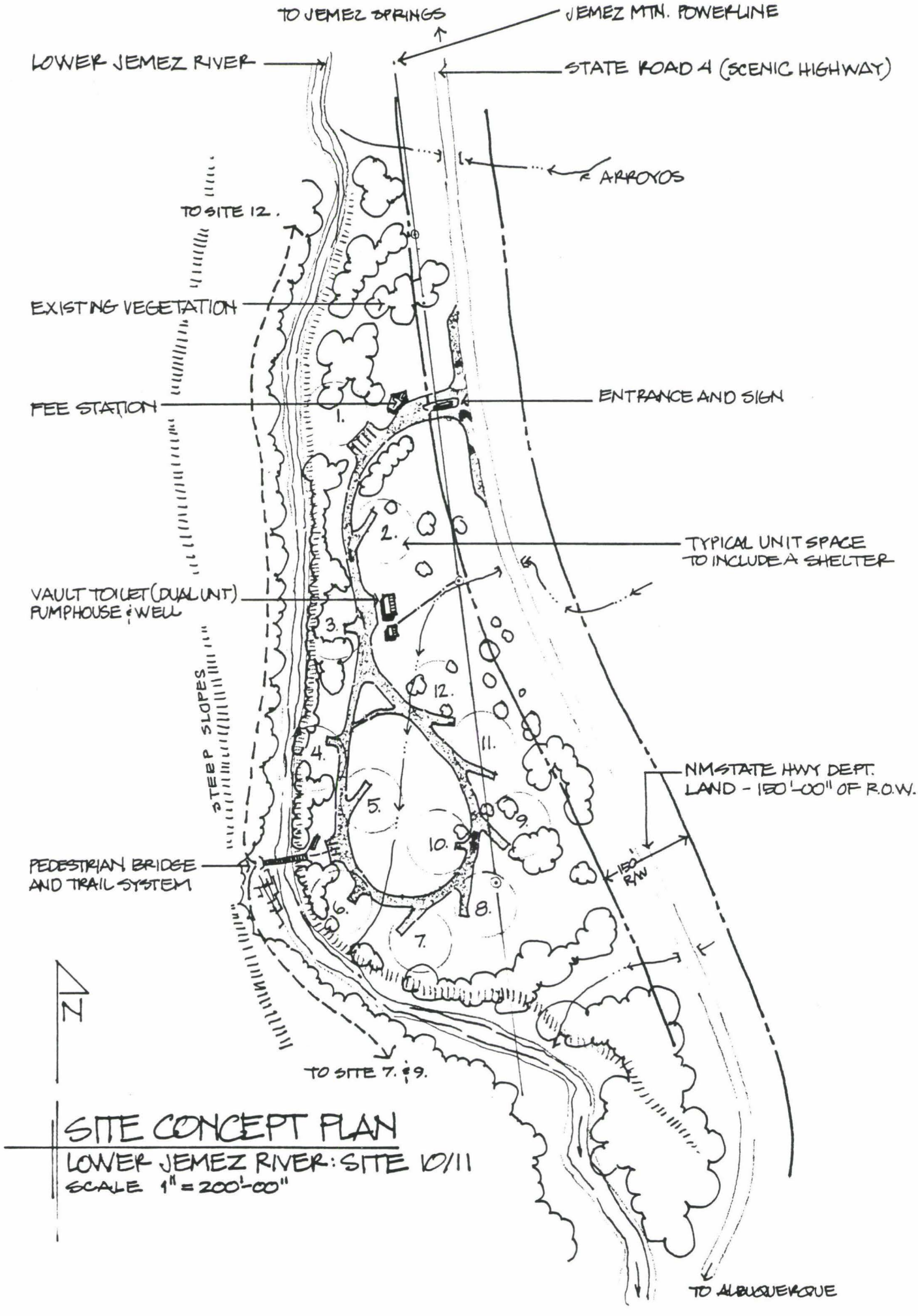


SITE CONCEPT PLAN

LOWER JEMEZ RIVER: SITE 1.

SCALE 1" = 200'-00"

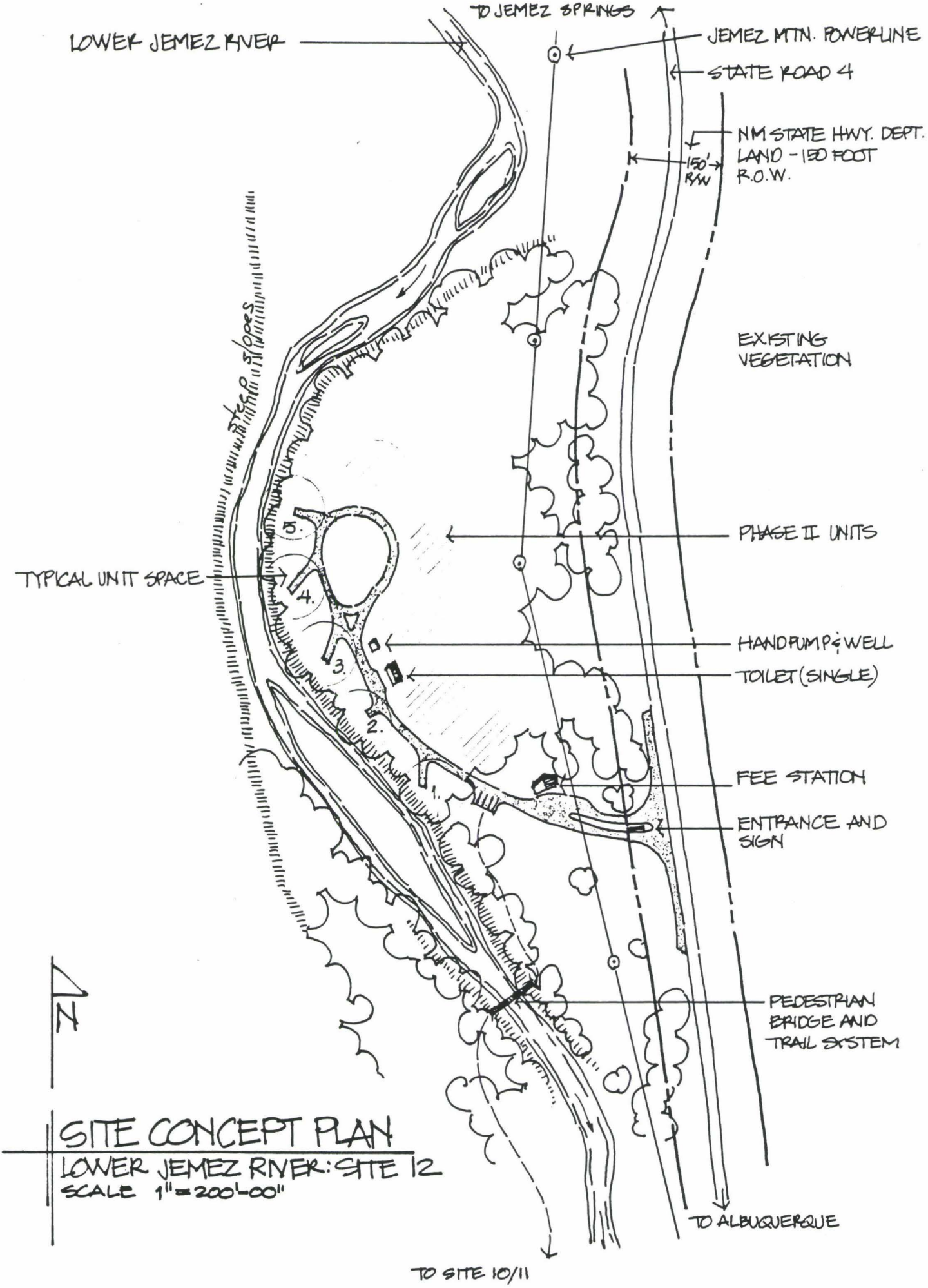

TO SITE 6 (NMSHD)
LOWER JEMEZ RIVER
TO JEMEZ SPRINGS
JEMEZ MTN. POWERLINE
STATE ROAD 4
150'-0" R/W
NM STATE HWY. DEPT. LAND - 150'-00" OF R.O.W.
mid-mark slope
PARKING - FISHING TRAIL SYSTEM
steep slopes
IMPROVE DITCH INTERCEPT
FEE STATION
ENTRANCE AND SIGN
TYPICAL UNIT SPACE
TOILET (DUAL UNIT)
PUMPHOUSE & WELL
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
N
Approx. 100 yr. floodline
TO SMALL PRIVATE STORE
TO ALBUQUERQUE
SITE CONCEPT PLAN
LOWER JEMEZ RIVER: SITE 5.
SCALE: 1" = 200'-00"



SITE CONCEPT PLAN

LOWER JEMEZ RIVER: SITE 10/11

SCALE 1" = 200'-00"



SITE CONCEPT PLAN

LOWER JEMEZ RIVER: SITE 12

SCALE 1" = 200'-00"

C

Appendix C: Economic Analysis of Alternatives

Alternative 1 - Conceptual Cost Esimate (1980 4th quarter dollar values)

Costs:

Average unit cost for dispersed area management in Roaded Natural ROS Zone (undeveloped, streams, and roads); includes all items reported in RM 2300-6 Block A, B, and C.

Average annual unit cost/RVD (Roaded Natural ROS) = $0.05/RVD
$0.05/RVD x 43,803 fishing (RVD) = $2,190.15
0/05/RVD x 7,497 picnic/etc. (RVD) = $ 374.85
Total Annual O&M Cost = $2,565.00

Benefits

Average annual use in the corridor, for the 20 year life period of the project (1986-2006) will reach the following levels:
(midpoint) Fishing (RVD's) = 43,803 @ $19.27/RVD/yr. = $844,084.00
(midpoint) Picnic/Camp (RVD's) = 7,497 @ $3.80/RVD/yr. = $ 28,489.00
Total Annual Benefit = $872,572.00

Costs: Analysis Present Value Discunted @ 10% for 20 years

Annual Cost ($2,565.00) (8.51356) = $ 21,837.30

Benefits - Present Value

Annual Benefits ($872,572.00) (8.51356) = $7,428,694.00

Evaluation
Total Benefits (Present Value) = $7,428,694.00
Total Costs (Present Value) = $ 21,837.30
Net Present Worth = $7,406,856.70
Benefit/Cost Ratio = $\frac{7,428,694}{21,837}$ = 340 : 1.0

Alternative 2 - Conceptual Cost Estimate (1980 4th quarter dollar values)

Costs - Full capacity development - (750 Forest Service)

Initial Construction

Site 1 -	14 car parking paved area/traffic control/entrance (FRT)	$22,000
	1.5 mile gravelled trail	$18,000
	landscaping/grading	$ 3,000
	signing	$ 3,000
	Sub-Total	$46,000.00
Site 3.	25 fishing gravel parking lot (FRT)	$17,000
	traffic control	$ 1,500
	150-foot gravel road (FRT)	$ 2,000
	landscaping/signing	$ 5,000
	Sub-Total	$25,000.00
Site 5.	25 car parking/3-5 units together (paved) (FRT)	$35,000
	2,500 foot paved road (20' width) (FRT)	$85,000
	12 picnic/camp sites @ $2,000 ea.	$24,000
	1 double unit toilet (solar assist vault)	$15,000
	traffic control (post & rock)	$12,000
	water system (underground well head/tank/submersible pump)	$ 7,000
	landscaping/signing/fee station/erosion work/gate	$24,000
	Sub-Total	$202,000.00
Site 7.	Same facilities cost (plus 10% factor) as Site 5. due to terrain *228,000 x 10%)	$250,800
	Sub-Total	$250,800
Site 9.	10 car parking (gravel) (FRT)	$ 8,000
	150 foot gravel road (FRT)	$ 2,000
	traffic control/landscaping/signing	$10,000
	Sub-Total	$20,000
Site 10/11.	Same facilities cost as Site 5, except additional cabanas for shading picnic units and landscape work	
	Site 5 - conceptual cost	$200,000
	12 cabanas (shelters) @ $2,500 ea.	$ 30,000
	special landscaping/erosion work/gate	$ 12,000
	Sub-Total	$242,000
Site 12.	Same facilities cost as Site 10/11, but reduced 20% to reflect lower PAOT ($242,000 x 20%)	$192,000
	Subtotal	$192,000
Site 13.	20 car gravel parking lot (FRT)	$16,000
	traffic control	$ 3,000
	road entrance (gravel) (FRT)	$ 4,000
	landscaping/signing	$ 2,500
	Sub-Total	$25,500
Site 14.	Same as Site 13.	$25,500
	Sub-Total	$25,500

Site 15. Same as Site 13 plus 20% $25,500

20%+ 5,100

Sub-Total $30,600

Special access treatments and rehabilitation of general corridor areas.

-one mile site fences @ $6.00/foot	$32,000
-general signing	2,500
-two pedestrian bridges @ $5,000 ea.	10,000
-3.5 miles constructed trails/gravel	$35,000
Sub-Total	$79,500
Total Project Construction Cost	$1,138,900.00
(Engineering) Survey & Design	80,000.00
Landscape Survey & Design	35,000.00
Contract Administration	50,000.00
Total Project Cost	$1,303,900.00
Engineering: FR&T Funds	662,000.00
Recreation: FLM Funds (incl. contract admin.)	591,900.00
Total	$1,303,900.00

Annual Costs

O&M Annual Costs = $41,062.00

750 PAOT x 365 M.S. = 273,750 PAOT days x $0.15* = $41,062.00/yr.

*Projected 20 year average forest O&M cost/pd.

Benefits

Average annual use in the corridor for the 20 year life period of the project (1986-2006) will reach the following levels:

(midpoint) Fishing RVD's = 43,803 @ $19.27/RVD/year = $844,084.00

(midpoint) Picnic/camp RVD's = 7,497 @ $3.80/RVD/year = $28,489.00

Total $872,572.00

L&WCF fees average annual charge over project life will be $8.00/visit

The following sites will have fee collection:

Site 5 = 90 PAOT x 365 M.S. x 0.45 P.U. = 14,782 site visits x $8.00 = $118,256

Site 7 = 90 PAOT x 365 M.S. x 0.45 P.U. = 14,782 site visits x $8.00 = $118,256

Site 10/11
= 90 PAOT x 365 M.S. x 0.45 P.U. = 14,782 site visits x $8.00 = $118.256

Site 12
= 70 PAOT x 365 M.S. x 0.45 P.U. = 11,497 site visits x $8.00 = $ 91,976

Total Projected Fees $446,744

Total Annual Benefit (RVD's) $872,572

Fees + $446,744

Total Annual Benefit $1,319,316.00

Costs: Analysis Present Value Discounted @ 10% for 20 years

Initial Cost (includes Survey/Design)	$1,303,900
Annual Cost (41,062) (8.51356)	$ 349,584
Total Present Value of Costs	$1,653,484.00

Benefits: Present Value

Annual Benefits	
RVD's = ($872,572.00) (8.51356)	$7,428,694.00
L&WCF Fees = ($446,744.00) (8.51356)	$3,803,382.00
Total	$11,232,075.00

Evaluation

Total Benefits (Present Value)	$11,232,075.00
Total Costs (Present Value)	$ 1,653,484.00
	$ 9,578,591.00
Net Present Worth	$ 9,578,591.00

$$\text{Benefit/Cost Ratio} = \frac{11,232,075}{1,653,484} = 6.79 : 1.0$$

Alternative 3 - Conceptual Cost Estimate (1980 4th quarter dollar values)

Costs - Phase I development (adequate for first 20 year period) = 535 PAOT (F.S.)

Initial Construction (1980 4th quarter $) Start 1986-87

Site 1 - 14 car parking lot (same cost as Alt. 2)	$46,000.00
Site 3 - 25 car parking/fishing (same cost as Alt. 2)	$25,000.00
Site 5 - 25 car parking (same cost as Alt. 2)	$202,000.00
12 picnic/camp units with fee	
Site 9 - 10 car parking/fishing (same cost as Alt. 2)	$20,000.00
Site 10/11 - 25 car parking (same as Alt. 2)	$242,000.00
Site 12 - 10 parking picnic/camp with fee	
(expand to 20 in Phase II)	$25,000.00
1 mile gravel trail	$ 7,000.00
Water well/hand pump/iodonator	$ 1,500.00
5 shelters @ $2,500 ea.	$12,500.00
traffic control (post & rock)	$ 5,000.00
1 single dual unit toilet	$ 8,000.00
landscaping/signing/fee station/gate	$15,000.00
Sub-Total	$74,000.00
Site 13 - 10 car parking (gravel) (same as Site 9 in Alt. 2)	$20,000.00
Site 14 - 10 car parking (gravel) (same as Site 13)	$20,000.00
Site 15 - 12 car parking (gravel) (expand to 25 in Phase II) (same as Site 13 plus 20%)	$24,000.00
Total Construction Cost	$673,000.00
(Engineering) Survey & Design	$ 60,000.00
(Land. Arch.) Survey & Design	$ 25,000.00
Contract Admin.	$ 30,000.00
Total Project Cost	$788,000.00
FR&T Funds	$355,000.00
FLM Funds	$318,000.00
	$673,000.00
Total Initial Construction Costs (S/D also)	$788,000.00

Annual Costs: O&M annual costs = 535 PAOT x 365 M.S. = 195,275 PAOT Days
The projected 20 yr. average Forest O&M Unit Cost/PAOT day = $0.15/pd
(0.15) (195,275) total annual cost $ 29,291.25

Benefits:

Average annual RVD benefits same as Alt. 2. $872,572.00
(more capacity in Roaded Natural dispersed
and more use of facilities)
L&WCF fees average annual charge $8.00/visit
(Same as Alt. 2)

The following sites will have fee collection:

Site 5 = 90 PAOT x 365 M.S. x 0.45 P.U. = $14,782 visits x $8.00 = $118,256

Site 10/11 = 90 PAOT x 365 M.S. x 0.45 P.U. = $14,782 visits x $8.00 = $118,256

Site 12 = 35 PAOT x 365 M.S. x 0.45 P.U. = $5,749 visits x $8.00 = $ 45,990

Total Projected Annual Fees = $282,502

Total Annual Benefit (RVD's)	$872,572.00
Total L&WCF Fees +	$282,502.00
Total Annual Benefit =	$1,155,077.00

Costs : Analysis Present Value Discounted @ 10% for 20 years.

Initial Cost (includes S&D)	$788,000.00
Annual Cost ($29,291.25) (8.51356)	$249,372.81
Total Present Value Costs	$1,037,373.00

Benefits: Present Value

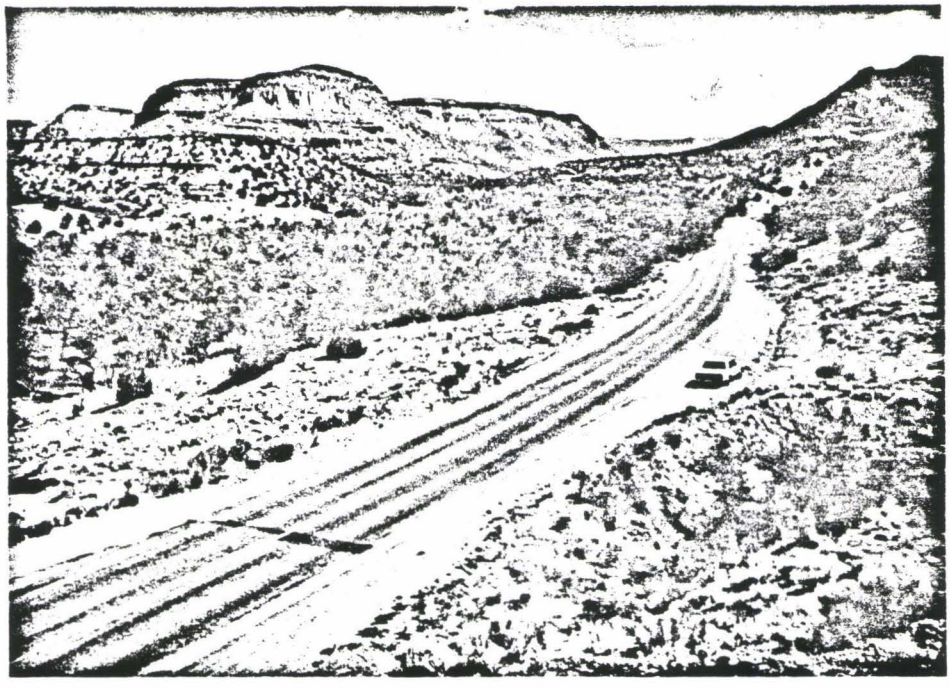
Annual Benefits	
RVD's = ($872,572) (8.51356)	$7,428,694.00
L&WCF Fees = ($282,502) (8.51356)	$2,405,098.00
	$9,833,792.00

Evaluation

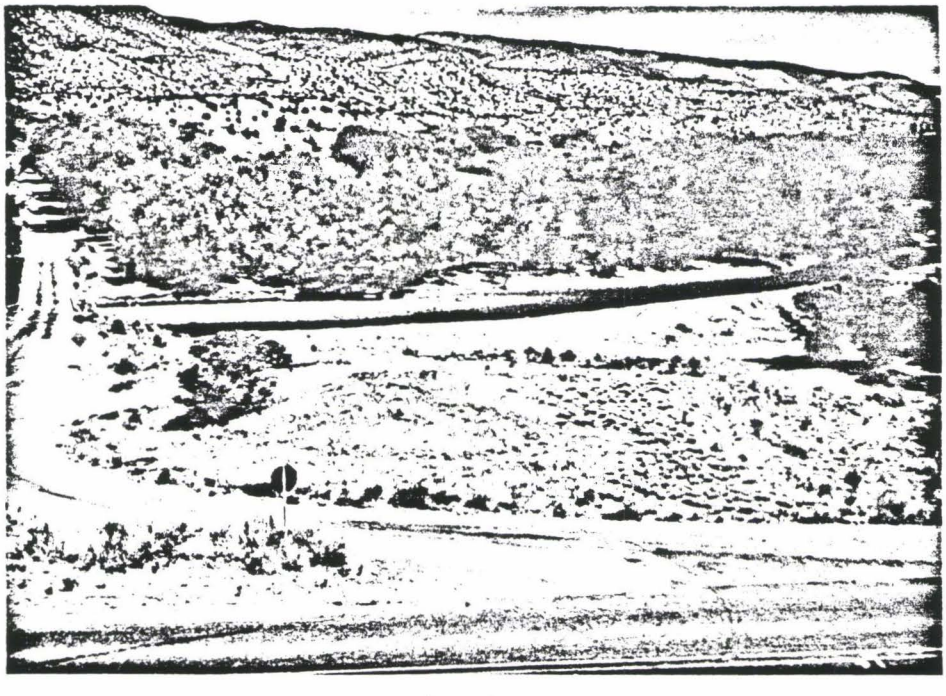
Total Benefits (Present Value)	$9,833,792.00
Total Costs (Present Value)	$1,037,373.00
	$8,796,419.00
Net Present Worth	$8,796,419.00

Benefit/Cost Ratio = $\frac{\$9,833,792}{1,037,373} = 9.48 : 1.0$

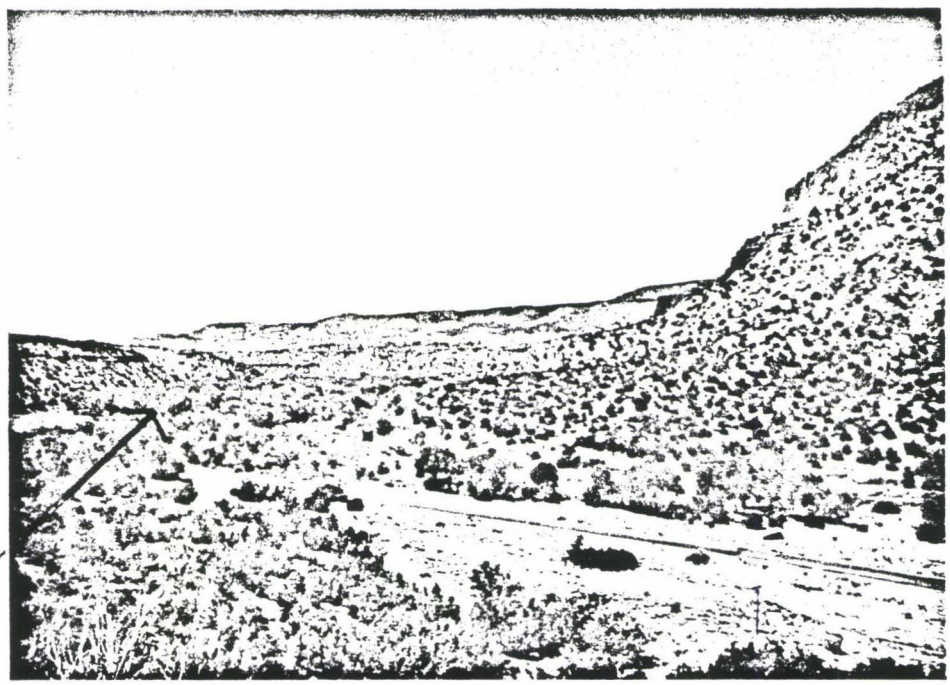
D



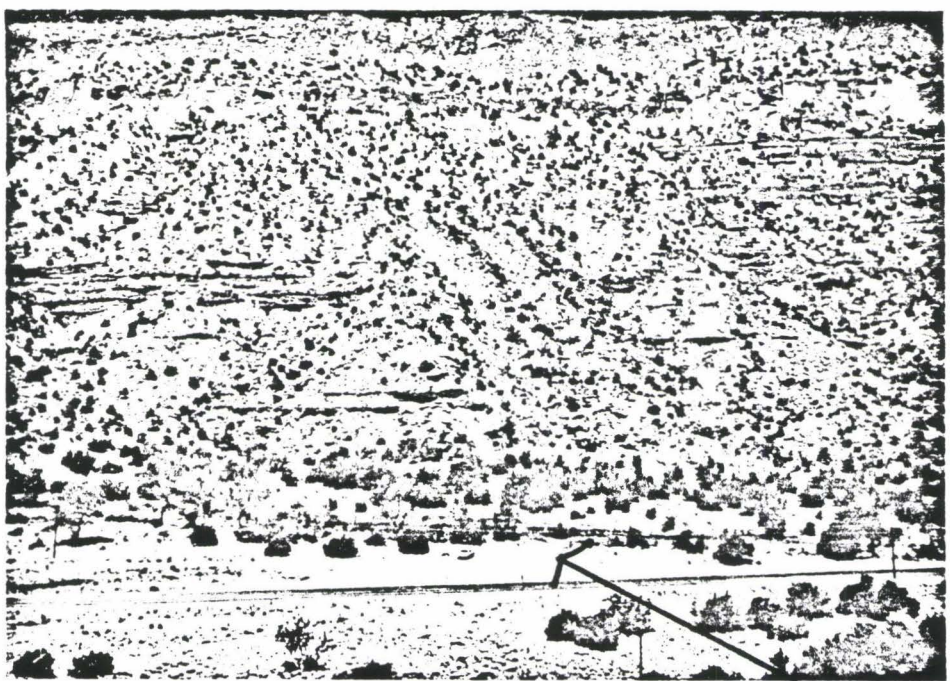
SITE 1 - Entrance sign location



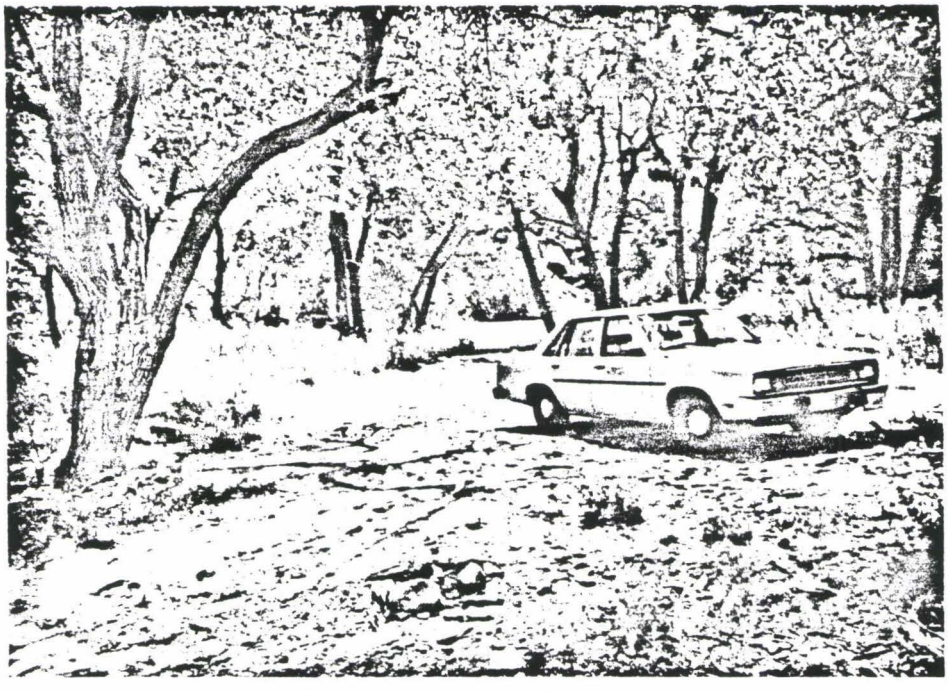
SITE 1 parking lot location



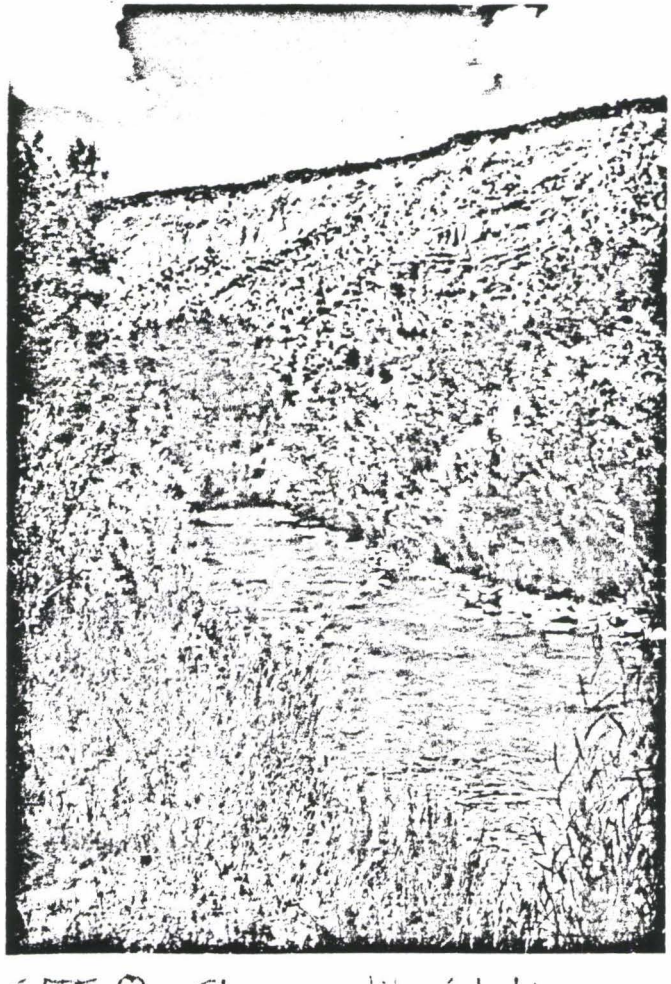
SITE 5 · General parking/picnic zone



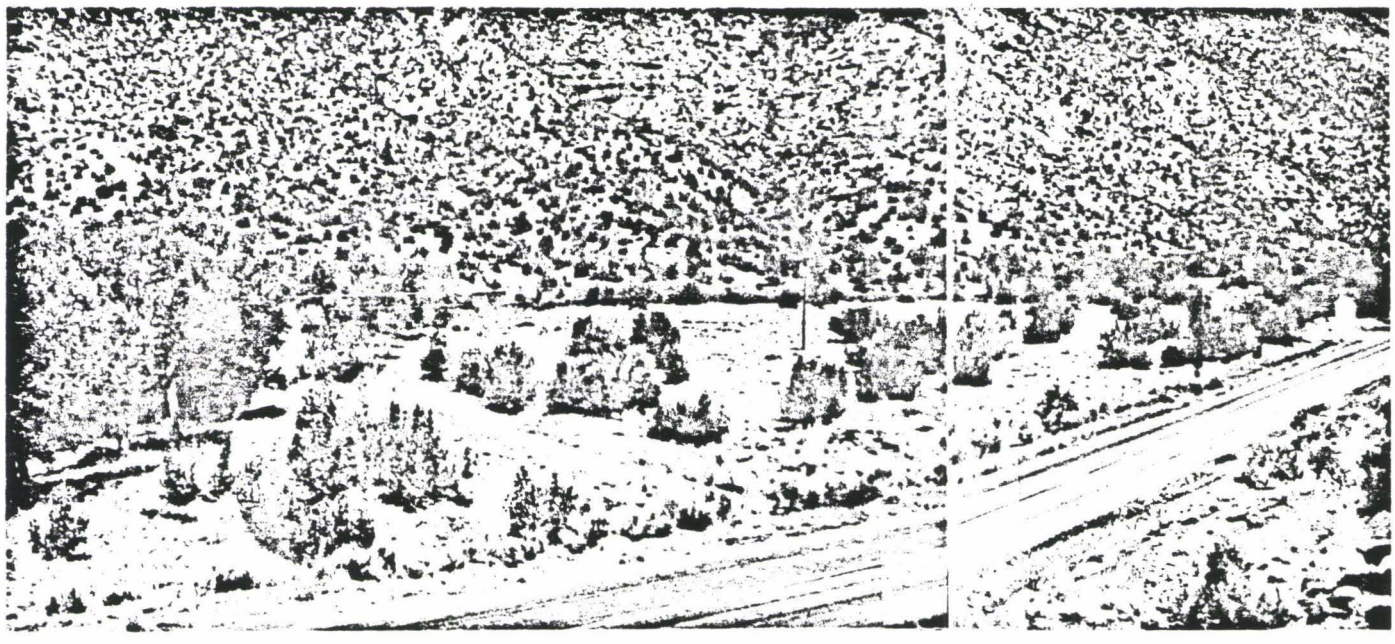
SITE 6 · Small pulloff within NMSHTO 150' R.O.W.



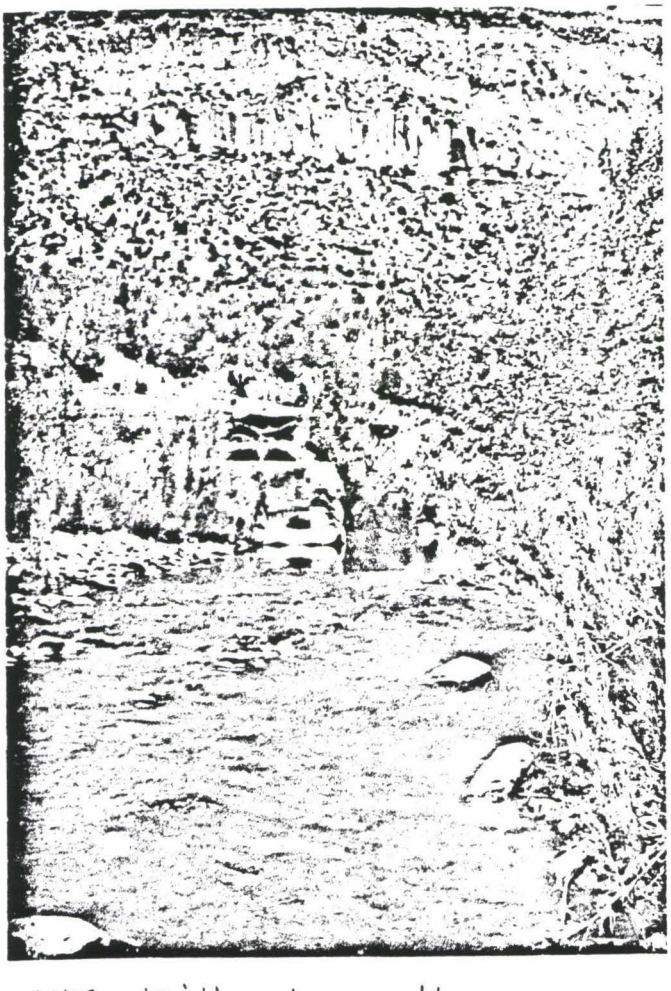
SITE 9 · Parking lot entrance/typical car traffic



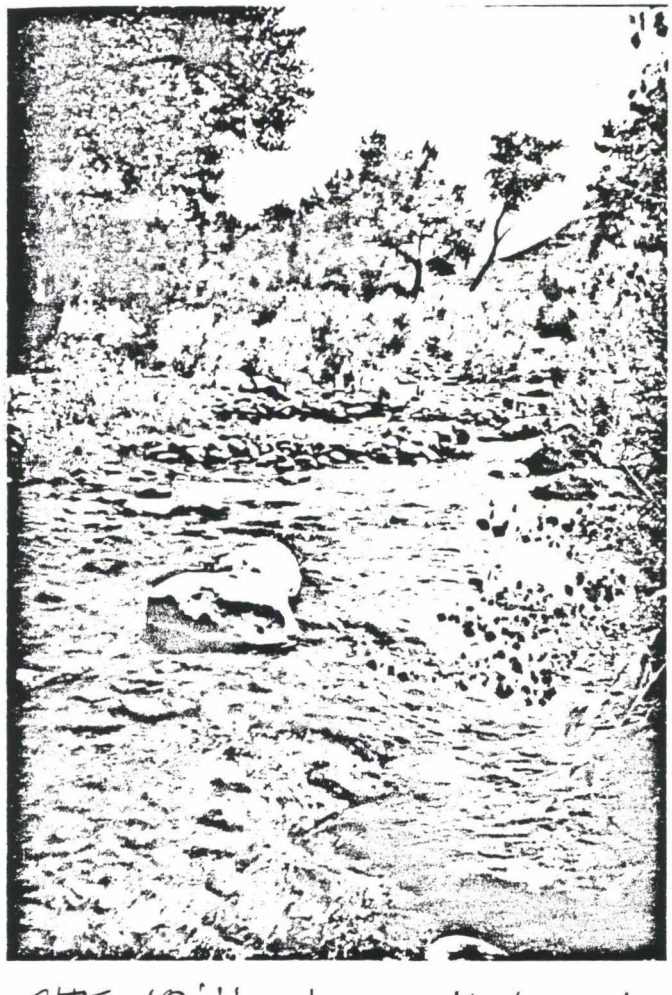
SITE 9 · Stream quality/stocking access



SITE 10 & 11 · suitable development area



SITE · 10 & 11 stream quality



SITE · 10 & 11 stream quality / users pools

SITE 15 · Parking lot between large cottonwoods

SITE 16 · NMSHD existing picnic rest area/rehab or remove